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ABSTRACT

Ninety New York City high school seniors spent a year in the Secondary Education Through Health (SETH) program at Mount Sinai Medical Center. The students pursued a science course with six environmental health units designed by SETH staff, and also took regular New York City Board of Education courses on the hospital premises. In addition, the students spent two mornings a week in patient care or research settings or studying the effects of pollutants on the health of individuals in East Harlem. This report focuses on the quality of the students' experiences in SETH. In doing so it addresses the larger question of how one documents and evaluates the experiential aspect of an environmental health curriculum and of environmental education programs in general. Student performance in the health environment setting is analyzed using the general education classes as a basis for comparison. It is concluded that SETH activities promoted students' involvement in health related situations and their development of entry level skills for medical and environmental health careers. Appended to this report is an extensive discussion on program evaluation methods, including the evaluation instrument used. Student interviews and reports on their perceptions are provided. Also attached are reprints of relevant journal articles, a community resource guide to East Harlem, student placement reports, and the actual SETH curriculum. (GC)

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SECONDARY EDUCATION THROUGH HEALTH - ENVIRONMENTAL HEALTH PROGRAM

1976 - 1977

MOUNT SINAI SCHOOL OF MEDICINE

FINAL REPORT - OFFICE OF ENVIRONMENTAL EDUCATION

CONTRACT NO. G007602025 AR

Lloyd R. Sherman, Ed.D.
Program Director

UD017908

Secondary Education Through Health - Environmental Health Program is characterized best as one that is committed to process education. The program's outcomes are determined by the integrative impact of its didactic, practical and counselling components. Both the didactic and practical components of the program are construed as instructional; and accordingly are the focus of the evaluation study in this report.

The environmental health component in concept and design was superimposed on the on-going program. In this regard all of the activities were integrated with the purposes of meeting the program's primary objectives of delivering educational services to the students to meet their needs for high school graduation and post-secondary educational training. Environmental health education over the course of the year took a central role in the program. The program's curriculum and training aspects were modified by the concept of environmental health. In this regard new arrangements with departments for students placements at the Mount Sinai Medical Center and at the Environmental Protection Agency were developed for student practical learning; new courses were added to the curriculum; presentations on the subject were made by the staff of the Community Medicine Department of the Mount Sinai School of Medicine, and special student projects in environmental health were developed.

The intent of the evaluation study was to assess 'in situ' learning. The report discusses the process and procedures of this assessment, findings and recommendations. The study sought to develop a means for collecting data on the learning processes as it occurred for students in different SETH settings generally referred to as formal (classroom) didactic; non-formal (experiential) and mixed settings. Levels of student functioning in these settings were coded and analyzed in terms of people (social dimension), data (cognitive) and things (equipment, machinery). The methodology involves live observations and coding using the SETH Setting and Behavior Inventory, and the Verbal Behavior Inventory. The findings indicate that overall student levels of functioning were at their highest in the environmental health projects and placements. The study with some modifications makes available for the first time a useful tool for assessing process education, giving program's like those in environmental education a handle to verify their effectiveness in terms of levels of student functionings. The evaluation model and methodology is among the significant products of this grant.

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EVALUATION REPORT

Joseph C. Grannis, Ph.D.
Evaluation Coordinator

Charles Cummings
Istar Schwager
Marion Schwarz
Evaluation Assistants

SUMMARY

OF

SETH - ENVIRONMENTAL HEALTH EVALUATION

1976 - 1977

Lloyd R. Sherman, Ed. D.
Program Director

Joseph C. Grannis, Ph.D.
Evaluation Coordinator

Charles Cummings
Istar Schwager
Marion Schwarz
Evaluation Assistants

During the 1976-1977 school year, ninety students from two New York City high schools spent their senior year in the Secondary Education Through Health (SETH) Environmental Health Program at Mount Sinai Medical Center. The SETH environmental health curriculum was developed within the context of the on-going SETH program, i.e. the program's curriculum and training aspects were directed by the concept of environmental health. In this regard new arrangements with departments for student placements at Mount Sinai and EPA were developed for student practical learning; presentations were made by the staff at Mount Sinai from Community Medicine and the Environmental Science Laboratory; and student environmental health projects were developed to bring together process learning and product development on identified community health issues.

All the students pursued a science course comprised of six environmental units designed by SETH staff, and also took regular New York City Board of Education English, Mathematics and Social Studies courses taught on the Hospital premises. In addition, the students spent two mornings a week in an environmental placement or project. The placements involved working as aides, assistants, and clerks in a variety of patient care and research settings. The projects involved studying the effects of pollutants on the health of individuals in the East Harlem community.

The report focuses on the quality of the student's experience in SETH. In doing so it addresses itself to the larger question of how one documents and evaluates the experiential aspect of an environmental health curriculum, and of environmental education program more generally.

The rationale, discussed in the First Progress Report, holds that experiential education evokes student capacities that would otherwise not be exhibited in a school setting, by engaging students directly with the objects, people, activities, and problems that are referents of their learning.

Two related objectives formulated the basis of the 'in situ' data collection observations and subsequent analysis of data: first, to ascertain levels of student performances with things (physical), data (intellectual)and people(social) in different settings; second, to identify conditions that were associated with higher levels of performance in different settings. The assumption was that student enactment of higher levels of physical, intellectual and social functioning and their more extensive use of access language maximizes learning.

The evaluation set out to identify the characteristics of settings in which students performed at high levels of competence by comparing the setting characteristics and student behavior evidenced in formal (didactic), non-formal (experiential) and mixed settings. The observation scheme used to explore a range of setting features included: task novelty, interaction format, number of peers present, staff role, data functioning, etc.

The underpinnings for the evaluation reflects social ecology's general concern with the relationships between physical, cognitive and social aspects of behavior milieus (Lewin, Barker, Soskin and John, Moos); the present investigators' particular concern with who or what controls these different aspects of the environment (Goffman, Bernstein, Grannis); occupational psychology's concern with the levels of people, data, and things functioning that are characteristic of different jobs (Fine); sociolinguistics' concern with the effects of different settings on language use (Gumperz, Hymes); and an interest in relating all these concerns to the environments of the students' educational and vocational development.

The point of view reflected here is that students in late adolescence have already developed basic communicative competencies and skills of functioning with people, data, and things in various contexts familiar to them and that what is now at stake in their education is the articulation of these competencies with the specifics of new contexts, in the present case their adaptation to the particulars of health career oriented activities. Methodologically, this gives priority to comparing settings to establish which evoke the highest level student performances, rather than concentrating on the gains emphasized in the pre-test/post-test model of learning.

To judge student performance in different program settings, SETH used an adaptation of the system for analyzing the complexity levels of data, things and people functioning that is employeed in the United States Employment Service's Dictionary of Occupational Titles to analyze virtually all jobs in the economy. The use of the D.O.T. scheme links environmental education with career education by anlyzing the environments and activities of students education in career terms. SETH is the first project in secondary school education to use the D.O.T. system to examine students' and staffs' levels of functioning in both school and work (placement) related contexts.

The soliciting or question asking behavior of students (access language) was used as an indicator of student control of the educational environment and as a primary behavior through which students gain access to skills and knowledge. The educationally relevant characteristics of the verbal environments included talk continuousness, goal, and type of talk occurring, and the relationship of talk to a task.

A purposive sample of 14 subjects was selected for observation and case study. Students' ethnicity, gender, Metropolitan Achievement Test reading scores and Norwicki-Strickland locus of control scores were used as the basis for selection. An attempt was made to select an equal number of high and low readers, males and females, Black and Hispanic students and internally and externally oriented students. Observations were made of the subjects in various settings, with each subject serving as his or her own control. At the end of the observation period subject perceptions of SETH settings were tapped through the use of structured interviews and a Work Environment Scale developed by Moos and Insel.

All observations were made by two observers: one observer used a Setting and Behavior Inventory (SBI) while the other simultaneously employed a Verbal Behavior Instrument (VBI). These instruments, both of which were developed for this assessment, have been described in the First Progress Report. An inter-observer reliability level of at least .70 was obtained for each of the variables. The SBI and VBI findings convey a detailed picture of SETH learning environments and of the subject behaviors associated with different setting characteristics. The SBI and VBI findings convey a detailed picture of the SETH Environmental Health learning environments and of the subject behaviors associated with the different setting characteristics. The following outcomes related to higher levels of student functioning and setting conditions are noteworthy.

VERBAL

1. Student talk time was highest in the mixed-setting projects.
2. Most student talk in settings was task-related.
3. The range of talk environments allowed for the use of verbal interactions important to the development and practice of entry level communications skills.
4. Soliciting rates were highest in the mixed setting, environmental health projects and in environmental health science classes, in the condition where: subjects were engaged in supervised tasks, subjects participated in the initiation of the task, the staff was either absent or active, and the task was novel.

SETTINGS

1. Subjects particpated more in the initiation of their own activities in environmental health projects and placements than in classroom.
2. Subject involvement was highest during supervised and unsupervised tasks and lowest during lectures and demonstrations.

PEOPLE

1. Subject's people functions varied inversely with those of staff. When staff functioning was low, as it was at times in placements and projects, the subjects people functioning was high.
2. Subject's people functions were lower in lectures and discussions than in settings where staff was functioning at lower power levels and working cooperatively with subjects.
3. High subject people functions were also associated with settings where there were fewer than 10 peers present and where subjects were engaged with manipulative objects at high complex levels.

DATA

1. Data functioning (intellectual activity) was highest in environmental projects.

2. High subject data functions were associated with moderate solicit rates in projects and classes but with high solicit rates in placements.

THINGS

1. Manipulative objects, rarely used in classes, were used frequently in placement and projects, but overall were used at high levels mostly by the staff.

Formal settings emerge as those in which talk is usually explanatory, theoretical, staff people functioning is higher power than that of students, manipulative objects are rarely present, staff initiates student activity most of the time, staff and subjects both function at moderate levels of data complexity and talk is usually continuous and task related.

The picture of non-formal settings is one of reduced discrepancy between the power of the teacher and learner as a function of their mutual relationship to the task in which they are engaged, often a concrete task involving manipulative objects.

Projects represent a combination of formal and non-formal characteristics. In projects subjects shared with staff the initiation of the tasks and worked cooperatively with staff. As in the non-formal settings, manipulatives were usually present and subjects were overtly active a majority of the time. However, projects share with formal settings almost continual staff and peer presence, and staff's operating at high power a large portion of time. However, unlike formal settings where staff rarely functioned low power in projects staff functioned at low level functions almost a third of the time, slightly more than staff functioned at this level in non-formal settings. In both projects and placements low power staff roles were associated with high power student roles.

Projects deserve particular scrutiny since subjects functioned at the highest levels of data, people and thing complexity and exhibited the highest rate of soliciting behavior in projects. In fact, the most general conclusion of the evaluation is that subjects functioned at their highest levels when staff alternated between enactive and didactic roles in supervising or engaging students cooperatively in operational tasks: a combination of conditions most evident in projects.

Clearly, the program exposed students to a range of settings in which a variety of skills could be learned and practiced. The settings appear to complement each other by providing students with opportunities to learn theoretical concepts and to also enact skills in real-time contexts. By operating with people, data and things students develop and practice entry level skills. The formal or didactic settings may, in turn, help students abstract, generalize and transfer the skills learned. The interplay between formal and non-formal settings appears to be one crucial strengths of the SETH Environmental Health Program.

of the

Interviews with subjects provided the evaluation unit with student perceptions of their own learning environments. Subjects seemed to value and benefit from the opportunity to discuss educational issues. Findings revealed that many subjects used different criteria for evaluating work and classroom settings. While experiential education was preferred in the work setting, a more formal approach was often favored for the classroom.

The Work Environment Scale, assessing subject perceptions of the component setting indicated that involvement and clarity were considered higher in projects and placements than classrooms and work pressure was considered greater in classes than in placements. Autonomy and peer cohesion were greater in the work groups than in classes. These findings, which may reflect student alienation from purely didactic settings, must be interpreted in relation to the obsevation and interview data. It is suggested that greater use be made of such environment scales and that student perceptions be tapped and discussed more frequently during the course of a program.

In the proposed revision of the data collection system it is suggested that the observation units be lengthened to enable one observer to record setting, behavioral and verbal data. It is also suggested that observation intervals be independent of one another so that more powerful statistical analysis may be performed on the data. Certain problematic or nondiscriminating variables would be eliminated from the system and more systemmatic and extensive use would be made of debriefings with subjects after observations.

The SBI and VBI systems generally proved effective instruments for assessing the diverse work and classroom setting that comprised the SETH program, and for assessing the verbal and functional behavior associated with different conditions. Further refinement of the evaluation system would lead to the emergence of a powerful instrument for comparing education in a range of both apprenticeship and classroom, non-formal and formal settings.

THE ENVIRONMENTAL HEALTH PROGRAM: DESCRIPTION AND OBJECTIVES

During the 1976-77 school year, 90 students from two New York City high schools spent their senior year in the Secondary Education Through Health (SETH) Program at the Mount Sinai Hospital. All of the students were members of Black or Hispanic low-income families. Their average reading level at the beginning of the year was 8.0. All of the students had evinced some interest in a medical or environmental health career prior to their coming to SETH.

This report focuses on the quality of the students' experience in SETH. In so doing, it addresses itself to the larger question of how one documents and evaluates the experiential aspect of an environmental health curriculum, and of environmental education programs more generally.

"Experiential education" engages learners directly with the referents of their learning-objects, people, activities, and problems not just invented for teaching. In an environmental health program, this most obviously includes collecting primary data on pollutants in the community, participating with professionals in laboratory and patient care settings, and communicating with the producers, the consumers, and policy makers involved in the economics and politics of pollution.

STUDENT PROGRAM:

All of the students pursued a science course comprised of six environmental health units designed by SETH staff. They also took regular New York City Board of Education English, mathematics, and social studies courses taught on the hospital premises. These four courses occupied the students eight half days a week throughout the year. In addition, the students spent two mornings a week in an environmental placement or project.

The placements involved working as aides, assistants, and clerks in a variety of patient care and research settings: Prenatal Care, EKG, Dental Care, Microbiology Lab, Emergency Room Lab/ Blood Bank, and other sections of the Mount Sinai complex, and an Environmental Protection Agency office outside Mount Sinai. The projects included publication of a bulletin reporting on local health hazards, and the production of a series of videotapes on the effects of such pollutants as noise, asbestos, and lead on the health of individuals and groups in the East Harlem community. Some students were engaged in a single placement or project for both semesters, while others switched from one assignment to the other at midyear. The science course, the placements, and the projects were all construed as components of the Environmental Health core of the SETH program.

ASSUMPTIONS:

Like experience, involvement implies "doing" rather than just passively observing. Listening and watching may indeed entail covert thinking and feeling, and can on occasion be highly involving in this sense. However, experiential educators from Dewey to Piaget have argued that some sort of interplay between external and internal actions is necessary for the full development of thought and feeling. The gap between abstract ideas and their concrete referents, the fact that abstractions have been lifted out of contexts in which typically many factors are at work, and a learner's need to test competencies, ask questions, express reactions, and obtain feedback in "real time" sequences, all are aspects of the argument for experiential education. The alienation of many students from purely formal education, especially students like those who came to SETH, is alleged to stem from the failure to provide opportunities for them to operate in, and on, the contexts their learning refers to.

SETH'S LEARNING OBJECTIVES:

Three general categories of objectives for students in the Environmental Health core of SETH were referred to at various points in the proposal for 1976-77. These can be summarized as (1) developing in the students an ability to apply ecological concepts to environmental health problems, (2) involving them in situations where health problems are being recognized and met, and (3) developing in them entry level skills for medical and environmental health careers. Products of the students' activity--news bulletins, videotapes, charts, essays, tests, and content oriented interviews of the students--furnish the major evidence bearing on the first of these objects. This evidence is discussed in a parallel report (Appendix D). Observations of the students "in situ", post observation de-briefings, and a questionnaire to tap students' perceptions of their science classes, placements, and projects as work-study environments, furnish the principal evidence of the quality of the students' involvement in environmental health situations, and their development of health career related skills. This is the evidence presented and analyzed in this present section of the evaluation report.

SETH was not a paraprofessional training program, nor would that necessarily have been the most valid way to interpret its aim to develop entry level skills for medical and health environment careers. On the formal side of their learning, the students' improvement of reading and writing, mathematical, scientific, and civic literacy was aimed at their gaining entry to post-secondary school educational programs for health related careers. On the non-formal side, students would be considered to be "entering" if they could be observed actually functioning at higher levels than simply taking instructions, copying information, or handling materials in health research and treatment contexts. In other words, if students were using an environmental research team's categories to classify data, or were manipulating--physically coordinating various elements of--laboratory equipment to conduct a test on some material, or were adapting to staff in a division of labor for a concrete task, these activities would evidence their participating in the intellectual, physical, and social work of the environmental health settings, and thus their manifesting entering skills.

EVALUATION FRAMEWORK:

The SETH program evaluation describes the various program settings and the students' performances in them.

In recent years, as alternative educational programs have proliferated--including a large number of environmental education programs-- it has become increasingly clear that an assessment of student performances must be able to specify the conditions under which the pertinent behaviors were observed (Charters and Jones, 1973).

It is a question of coming to understand what settings evoke students' competencies, and finding out as precisely as possible the characteristics of these settings that might be associated with student performances. One wants to know not only about the students' functioning, but what the students have been exposed to in settings where they themselves are not externally active, yet where their attention manifests a high degree of internal involvement.

In short, the environment of the students' behavior must be studied. Congruent with its aims for the students themselves, SETH chose an environmental approach to the assessment of the quality of the students' experience in the program.

Adolescent students have already developed skills of interpersonal relating, data classification, and so on, in various contexts familiar to them, so that what is at stake is the further development of these competencies in new contexts, in the present case their adaptation to the specifics of health related careers. What evaluation must examine in experiential education is not learning thought to take place simply between the beginning of a program when it is not manifested and a later point in time when it is, *i.e.*, the gains of the conventional pre-test/post-test model of learning.

Experiential education postulates that certain settings more effectively evoke capacities that the students have already developed: capacities to deal with people, data, and things, that are not suspected because the students do not display them in more stereotypical classrooms. Ideally, an interplay can be envisioned between the non-formal and the formal aspects of a program such as SETH's. The non-formal engagement of the students' competencies creates experience (experience is not independent of action) which formal instruction then makes more generalizable, especially through the labeling of the experience. The formal learning, in turn, renders more information available in the non-formal settings, thus generating still more experience. Central to all this is the control that the students gain over the conditions of their learning and experience. SETH sees the overlap between the formal and non-formal, or academic and experiential, as crucial to enhancing the students' control. This overlap is spoken to again in the section that follows.

SETTINGS IN SETH:

The SETH program included settings that were formal, non-formal, and mixed formal and non-formal, *i.e.*, different combinations of didactic and experiential. These settings are schematized in the following way:

GENERAL EDUCATION	ENVIRONMENTAL HEALTH EDUCATION		
English Mathematics Social Studies	Science Course	Projects	Placements
FORMAL SETTINGS		NON-FORMAL SETTINGS	

English, mathematics, social studies, and science were all pursued in classroom settings where there was a "teacher", an individual whose principal role was teaching, and where the verbal expository proportion of the activity was presumed to be relatively high.

Placements entailed the students' participating in out-of-classroom settings where there was typically no one whose principal role was teaching, and where the verbal expository proportion of the activity was presumed to be relatively low. ("Presumed" refers here to the usual assumptions about formal and non-formal settings; see Scribner and Cole, 1973. These assumptions will be checked in the data analysis below.) Projects involved students in the observation and analysis of health environments outside the classroom, but were conducted at least half of the time in classrooms, and were led by SETH teaching staff. Thus they might be expected to have manifested a mix of formal and non-formal characteristics. In addition to more verbal formulation in the formal setting, these characteristics includes more "why" questions and explanations and less connection between language and action. The non-formal setting is characterized by more learning associated with using a tool or scheme to accomplish some immediate purpose, rather than learning something to accomplish a future purpose; more learning by observation and imitation and more learning through identification and cooperation with those who have skills in the non-formal setting. (Scribner and Cole, 1973.)

To make judgments about students' and staff's performances in the different program settings, SETH used an adaptation of the system for analyzing levels of data, things, and people functioning that is employed in the United States Employment Service's Dictionary of Occupational Titles*. (D.O.T. is used to analyze virtually all jobs in the economy.)

The idea of "levels" here is a hierarchical one. Skills at one level of functioning are considered to be more comprehensive or complex than those at a lower level, and thus generally subsume those at lower levels, as, for example, the intellectual skills of analysis subsume those of sheer information retrieval and comparison.

The potential advantages of using the D.O.T. scheme are immediately evident. Instead of relying soley on more general or anecdotal testimony that students were involved and useful in the work settings, one can ask precisely what levels of staff functioning students are observing and coordinating with, and what levels they themselves are functioning on.

This use of the D.O.T. scheme links environmental education with career education by analyzing the environments and activities of the students' education in career oriented terms. SETH is the first project in secondary school education to use the D.O.T. system to examine students' and staff's levels of functioning in both school and work related contexts.

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* Washington: U. S. Department of Labor
U. S. Employment Service
Dictionary of Occupational Titles. (2 vols.,3rd ed.; 1965.)
See also Fine and Wiley, 1971.

SETH supplemented the D.O.T. scheme with an analysis of verbal soliciting behavior of students and staff in the various program settings. Verbal soliciting behaviors are all those verbal behaviors that call for a response from an addressee, i.e. questions, requests, demands, suggestions, contradictions, and so forth -- in sum, verbal behaviors that call for a response from the addressee.

Students' questioning had been identified by SETH staff as a particularly important learning behavior that they wanted to foster. A member of the evaluation unit, Schwarz, who had been a teacher with SETH in a previous year, had oriented to verbal soliciting more generally as crucial for the students' gaining access to new information and situations. Schwarz views verbal soliciting as being greatly influenced by language context, i.e. the setting conditions for language behavior.

Higher rates of students' soliciting related to health environment topics or activities, together with higher levels of students' data, people, and things functioning in health environment contexts, were defined as the principal student behavioral objectives of the SETH Environmental Health Program. Involvement, a measure of the intensity of a subject's attention or arousal to a task, was also included in the behavioral objectives for subjects.

PROCEDURES:

The evaluation unit developed a detailed observation scheme to explore a broad range of setting features along with students' levels of functioning and verbal soliciting. Both the number of subjects and the number of observation hours were limited in order to make possible this breadth, and to allow time for the analysis that the data lent itself to.

Early in the Fall semester, a purposive sample of 14 subjects was selected for observation and case study. Students' ethnicity, gender, Metropolitan Achievement Test reading score, and Nowicki-Strickland locus of control score, were used to set up categories. The Nowicki-Strickland instrument determines the extent to which an individual perceives that can influence the outcome of valued events in life,(like having friends and doing well in school) as opposed to those being determined by fate or forces beyond one's control (referred to as externality in this study). Perceived locus of control has been shown in other research to correlate with many other attributes of individuals, particularly educational and occupational aspiration and achievement. This variable was controlled for in the present research. Other variables controlled for were ethnicity, gender, and reading score, which speak for themselves as potentially important variables among students.

Fourteen subjects were randomly drawn from the categories formed with these variables. The subjects were distributed as follows:

TABLE 1

Distribution of Observation Subjects

	Black		Hispanic	
	Male	Female	Male	Female
High reading, high external	1	1	1	0
High reading, low external	1	1	1	1
Low reading, high external	1	1	1	1
Low reading, low external	1	1	0	1

There were no male Hispanic students who were low on both reading and externality, and no female Hispanic students high on both reading and externality, at the time of selecting the sample.

DESIGN:

Since each student was being observed in various settings, each student was his or her own control, for the purpose of comparions of student behavior in different settings. Comparisons between high and low reading, male and female students, etc., can also be made, though they have been constrained by not having students of every trait combination in Table 1.

Each of the 14 subjects was observed individually in both class and placement and/or project settings, during the Fall and the Spring semesters for an average total of about 7 observer hours per subject. In addition, a variety of informal observations were conducted in the different settings, and each subject was interviewed both formally and informally at various times.

THE OBSERVATION INSTRUMENT:

Two systems of observation were used - each system and observation required its own observer. One observer used a Setting and Behavior Inventory (SBI) while the other simultaneously employed a Verbal Behavior Instrument (VBI). These instruments, both of which were developed for this assessment, have been described in a previous report. (SETH Evaluation Unit First Progress Report, 1977.) In general, the SBI recorded at successive five minute intervals an inventory of the people (school or hospital staff, student peers, and patients or other individuals), data sources, and things related to a subject's activity; staff's, peers', and subject's highest levels of functioning with people, data, and things; the format for interaction between the subject and other people in the setting; and the subject's level of activation, initiation, and involvement.

While verbal as well as nonverbal behavior figured in the SBI observation, the VBI examined the verbal behavior in much greater detail, recording the goals and task relatedness of this behavior, and the frequency and direction of solicits (verbal utterances seeking a response) and responses, over five minute intervals concurrent with the SBI observation. The two observers also made informal notes on the settings and behavior. The subject wore a wireless microphone, and a tape recording was thus made of the verbal interaction in the subject's vicinity. Finally, subjects were debriefed following selected observations, and all subjects were interviewed about their classes, projects and/or placements, at the conclusion of the school year.

An interobserver reliability of at least .70 was obtained for each of the observation variables in the form in which they are presented in this report. A number of the variables have been condensed from finer discriminations in order to obtain this reliability, and for greater economy of reporting.

The fact that the observers followed individual subjects for periods of time varying between 15 minutes and an hour and a half means that various specific observations were likely to be repeated from one five minute interval to another. For example, if staff was leading a discussion during a given 5 minute interval, and subject was listening but not speaking or taking notes during this time, there was a certain likelihood that staff continued to lead a discussion during the ensuing 5 minutes, and, if not with the same probability, that subject continued simply to listen. This inter-dependence of the observations from one 5 minute interval to another within an observation session for a given subject violates the assumption of non-interdependence made by most statistical tests of significance. It is possible to locate these so-called Markov chains of sequentially interdependent observations, and to test the significance of transformations of the data. However, this procedure was judged to be too elaborate for the present study. It would have higher payoff for a subsequent study that first of all modified its categories and sampling procedures in accordance with the most obvious things learned from this present exploratory study. This will be discussed further in a concluding section. The findings of the present report will be presented as percentages and cross-tabular trends, with no attempt to ascertain their statistical significance.

FINDINGS

Comparison of the General Education and Health Environment Settings.

The strategy of this first analysis is to use the General Education classes -- English, mathematics, and social studies -- as relatively familiar baselines from which to judge the properties of the Health Environment settings and the performance of subjects observed in them.

The SETH English, mathematics, and social studies were carefully planned courses in which the degree of students' involvement generally appeared to be higher than one has come to expect in inner-city classrooms. In their end-of-year class ratings, the subjects rated these courses in mostly positive terms. The General Education courses, then, are not straw men for this comparison.

Table 2 summarizes the proportions of time the subjects were observed under various conditions in the General Education and Health Environment settings of SETH, and the proportions of time the subjects manifested various behaviors in these settings. The long table is easily read and can be approached as an abstract of these first findings. For each variable, for example School or Hospital Staff Presence, the percentages add up to 100% within each of the four categories of settings included, the General Education classes, the Environmental Science classes, Health Environment Projects, and Hospital or Agency Placements. Thus subjects were observed in General Education settings without peers 1% of the total time observed in the General Education classes, 12% of the time with

1 to 5 peers present, 17% with 6 to 10 peers present, and 70% with 11 or more peers present. This means that the subjects virtually never were observed in isolation from other students in the General Education classes, though they were found in small or medium size groups some of the time. With respect to the question of what interaction formats were employed in the General Education classes, the 100% of time that subjects were observed in these classes breaks down into 10% lecture or demonstration formats, 57% discussion, 32% supervised task, and 1% unsupervised task.

TABLE 2

Proportions of time subjects were observed under various conditions in each SETH Program component.

	GEN.ED.	HEALTH ENVIRONMENT		
	Gen.Ed. Classes	Env.Sc. Classes	Project	Placement
Total number of 5 minute intervals observed.	145	72	105	210
SOCIAL ENVIRONMENT				
A. Level of staff activity in relation to subject over 5 minute intervals.				
0. Not present in subject's vicinity.	12%	6%	7%	27%
1. Present, but not active with S	11%	7%	5%	6%
2. Active with S part of 5 minutes	30%	18%	34%	16%
3. Active with S most of 5 minutes	47%	69%	54%	51%
B. Peers present with subject				
0. No peers in setting	1%	0%	0%	74%
1. 1-5 present	12%	0%	55%	23%
2. 6-10 present	17%	35%	39%	3%
3. 11+ present	70%	65%	6%	0%
C. Interaction format				
1. Lecture/demonstration	10%	4%	1%	19%
2. Discussion	57%	76%	19%	4%
3. Task supervised by or co-operative with staff	32%	20%	65%	43%
4. Task independent of staff	1%	0%	15%	34%
D. Staff people functions				
0. No staff relationship to subject manifest	3%	0%	10%	34%
1. Instructing, conducting recitation	56%	54%	46%	16%
2. Supervising, moderating discussion	34%	46%	14%	25%
3. Consulting or lower power function	7%	0%	30%	25%

	GEN.ED	HEALTH ENVIRONMENT		
	Gen.Ed. Classes	Env.Sc. Classes	Project	Placement
E. Subject people functions				
0. No relationship to people manifest	2%	0%	10%	24%
1. Taking instructions, helping	34%	55%	18%	31%
2. Exchanging information	62%	32%	31%	18%
3. Serving or higher power function	2%	13%	41%	27%
F. Initiation, direction of ongoing activity				
1. Others initiate only	61%	54%	32%	30%
2. Subject and staff w/w.o. peers	26%	32%	50%	32%
3. Subject and peers only	8%	0%	18%	8%
4. Subject only	5%	14%	0%	30%
G. Subject activity level over 5 mins.				
0. Off task	7%	0%	0%	1%
1. Observing only	26%	40%	13%	14%
2. Overtly active part of time	50%	44%	54%	32%
3. Overtly active most of time	17%	17%	33%	54%
H. Intensity of subject's attention or arousal to task				
0. Off task	8%	0%	0%	1%
1. Low	24%	21%	14%	8%
2. Medium	52%	54%	33%	40%
3. High	17%	25%	53%	51%
INTELLECTUAL ENVIRONMENT				
I. Use of symbolically encoded data				
0. Not used in setting	7%	8%	18%	24%
1. In use in setting	93%	92%	82%	76%

	GEN.ED.	HEALTH ENVIRONMENT		
	Gen.Ed. Classes	Env.Sc. Classes	Project	Placement
J. Task novelty				
1. Familiar situation and information	5%	40%	7%	20%
2. Familiar situation, new information	88%	42%	67%	61%
3. New situation, familiar information	1%	10%	2%	1%
4. New situation and information	6%	8%	25%	18%
K. Staff data functions				
0. Staff not in setting	12%	6%	7%	27%
1. Data functions not manifest	10%	1%	12%	10%
2. Low data function level	18%	54%	6%	20%
3. Medium levels	41%	39%	53%	27%
4. High levels	19%	0%	22%	17%
L. Peer data functions				
0. Peers not in setting	1%	0%	0%	74%
1. Data functions not manifest	26%	4%	5%	10%
2. Low data function level	13%	68%	7%	10%
3. Medium levels	55%	26%	71%	4%
4. High levels	6%	1%	17%	1%
M. Subject data functions				
1. Data functions not manifest	27%	10%	8%	25%
2. Low data function level	26%	63%	12%	32%
3. Medium levels	44%	28%	66%	39%
4. High levels	3%	0%	14%	4%
PHYSICAL ENVIRONMENT				
N. Manipulative objects (other than reading and writing materials) used in setting				
0. Not used in setting	95%	100%	26%	21%
1. Used in setting	5%	0%	74%	79%

	GEN.ED.	HEALTH ENVIRONMENT		
	Gen.Ed. Classes	Env.Sc. Classes	Project	Placement
O. Staff, thing functions				
0. Staff not using things	96%	100%	49%	45%
1. Low	1%	0%	0%	12%
2. High	3%	0%	51%	43%
P. Peer things functions				
0. Peers not using things	97%	100%	30%	87%
1. Low	3%	0%	11%	13%
2. High	0%	0%	59%	0%
Q. Subject things functions				
0. Subject not using things	95%	100%	41%	26%
1. Low	5%	0%	33%	51%
2. High	0%	0%	26%	23%
VERBAL ENVIRONMENT				
R. Talk continuousness				
0. Silence	1%	1%	3%	16%
1. Sporadic talk	20%	10%	45%	52%
2. Continuous talk	79%	89%	52%	31%
S. Talk task relevance				
0. Silence	1%	1%	3%	16%
1. High	78%	96%	58%	76%
2. Partial	17%	3%	31%	4%
3. Unrelated	4%	0%	8%	3%
T. % of peer participation				
0. Setting silence	1%	1%	3%	16%
1. 0 - 10%	35%	26%	14%	65%
2. 11 - 50%	38%	57%	32%	7%
3. 51 - 100%	26%	15%	51%	12%

	GEN.ED.	HEALTH ENVIRONMENT		
	Gen.Ed. Classes	Env.Sc. Classes	Project	Placement
U. Goal of Talk*				
0. Silence	1%	1%	3%	16%
1. Assist manipulation of object	1%	0%	47%	40%
2. Explain, demonstrate	61%	89%	27%	40%
3. Theoretical	42%	36%	23%	23%
4. Future or past performance	28%	17%	22%	19%
5. Not related to task	14%	1%	12%	9%
6. Affect	6%	3%	10%	4%
V. Subject's rate of Soliciting				
0. None in 5 minute interval	50%	49%	17%	46%
1. 1 - 3	32%	29%	46%	37%
2. 4 - 6	10%	14%	18%	9%
3. 7+	8%	8%	19%	9%

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* More than one goal of talk could be noted during a five minute interval, and thus the column percentages add to more than 100%.

The ensuing discussion is a summary interpretation of Table 2.

A. Social Environment

Variables 'A' through 'H' describe different facets of the staff and student configurations in the various settings. They show that school staff were present in the phenomenal vicinity of subjects -- not just in the same room, but in a relationship of mutual awareness and potential interaction -- most of the time in General Education classes, Environmental Science classes, and projects alike. Hospital staff, in the placement settings, were present in the subjects' vicinity three quarters of the time. The number of student peers involved in activity with the subject was greatest in classes, less in projects, and usually zero in placements. Discussion was the predominant format for interaction in the Environmental Science classes, and to a lesser extent in the General Education classes. Supervised tasks -- including both instructional assignments and activity in which subjects cooperated with staff in a productive task like making a videotape, producing a news bulletin, or analyzing blood and urine specimens -- were observed least in Environmental Science, somewhat more in General Education, and considerably more in projects and placements, especially projects, where two thirds of the time was spent in supervised tasks. Independent tasks were virtually never observed in General Education and Environmental Science, but occupied nearly a sixth of the time in projects and fully a third of the time in placements.

Supervision and staff presence were not necessarily equivalent. A task could be characterized as supervised because staff moved in and out of the subject's vicinity to check and assist with the task, and yet throughout a particular five minute interval staff might be occupied elsewhere in the room with other students. Conversely, staff might be present in the same setting with a subject but not supervising subject's task, for example, when a subject was filling test tubes while staff, in a parallel but not cooperative task, was preparing media for the test tubes. These comments clarify what might otherwise appear to be inconsistencies among the figures reported in Table 2.

The staff people functions and subject people functions data contain further seeming inconsistencies, but the patterns are important enough to warrant trying to explicate them. Consider the fact that discussion was observed 19% of the time in projects, and tasks supervised by or co-operative with staff were observed 65% of the time in projects; yet staff people functions, in relation to subjects, were categorized as "supervision, moderating discussion" only 14% of the time in projects. It is possible that coding error accounts for some of this discrepancy. Contributing more, however, is the fact that the staff people functions can change within a general interaction format. A group's planning a videotaping, for example, might have been coded as a task that was co-operative between students, including the subject, and staff. Staff, however, might at some times have acted in a relatively high-powered instructing way; at other times supervising, making sure students were working effectively and at still other times have served as a resource for the students, in what the observer perceived as a relatively low power role.

CORE FINDINGS OF SOCIAL ENVIRONMENT

The concept of relatively low and high "power" roles or functions has just been used, and leads into the core of the findings on the social environment of the SETH settings. The following list displays the SETH modification of the Dictionary of Occupational Titles list of people functions:

Staff Power	Functions	Student Power
Low	Taking instructions, helping	Low
	Exchanging Information	Medium
	Serving	High
	Collaborating	
	Coaching	
	Persuading	
	Diverting, Empathizing	
	Consulting	
Medium	Supervising, moderating discussion	
High	Instructing, conducting recitation	
	Treating	
	Negotiating	
	Mentoring	

The idea of the original D.O.T. scheme, as stated before, is that higher level functions are more complex in that they involve successively more judgments. Further, the scheme is hierarchical, the higher levels of functioning subsuming the lower ones. What the SETH researchers realized is that the D.O.T. scheme is also hierarchical in the sense of assuming a control or power hierarchy. The category "collaborating" has actually been added to the list by SETH, to recognize situations where staff and students, or students and students, function with each other at a level of equal division of labor and power. Other changes include phrases to clarify the D.O.T. levels; for example "conducting recitation" has been added to instructing, and is distinguished from "moderating discussion", a more student-oriented function, which has been added to supervising. Still other changes involve the relative levels of the different functions, specifically, exchanging information and serving occupy the reverse order from their order in the D.O.T., and the order of "supervising","instructing", and "treating" has been changed from the D.O.T.'s instructing, treating, and supervising. Supervising in the educational settings of SETH was not as complex as the D.O.T. presumed. Furthermore, it represented a lower power level than instructing, for example as more of the initiation of specific actions passed to students in supervised activity or discussion (see below).

On the student side, the power levels represent the evaluators' opinions about what was significant in SETH. Taking instructions was a low power function, and exchanging information (not just giving right answers to didactic questions, but students' asking questions for information they did not have, or providing information staff did not have) was a higher function.

The D.O.T. equates helping with taking instructions. In a future use of the scheme, helping and taking instruction would be separated, perhaps putting helping in the same category with serving and thus at the high level of students' people functioning. Consider the example of a student helping a dentist conduct an operation. In one case a student held a mirror in a patient's mouth, and in another case a student held a suctioning device to keep blood clear from a tooth being extracted. In both cases the students had to respond to continual developments in the operations. This helping appeared to require a great deal more sensitivity to other persons, both staff and patient, than taking instructions -- at least for the SETH students, for whom the dentistry was a much newer situation, and perhaps even more generally.

Thus the power levels drawn for the students in the scheme above represent how the data has been organized in Table 2, but not what would show if the helping situations were recoded to separate them from receiving instructions. As it stands, one must interpret the placement figure of 31% for subjects' taking instructions and helping to include a substantial proportion of helping as illustrated above, in contrast to the classroom settings, where the percentages for taking instructions and helping actually include very little helping in the explicit sense.

It can now be seen that staff related to subjects in low power roles considerably more in projects (30%) and placements (25%) than in the General Education classes (7%) or the Environmental Science classes. If one calculates on the basis of just the time that staff were observed functioning in some role in relation to subjects, then the low power roles occupied 7% of staff time in the General Education classes, 0% in the Environmental Science classes, 34% of staff time in projects, and 37% of staff time in placements. At the same time, subjects functioned in high power roles more in projects (41%) and placements (27%) than in General Education classes (2%) and Environmental Science classes (13%), and even more if one takes into account the fact that helping, which occurred most in placements, is not reflected as a high power role in these figures.

The value of using the D.O.T. system would be greatly compromised if one simply changed the levels around to fit what was difficult for students, instead of their reflecting the presumed more general hierarchy of difficulty. Much rethinking needs to be done with this part of the observation system especially as it stands. However, it has already produced evidence that in projects and placements students functioned at more complex levels, their relationship with staff and with students was more co-operative, involving the complementary movements of staff power down and student power upward.

The most varied people functioning was observed in the case of one subject whose placement, conducting occupational therapy on a recovery ward, involved her more extensively with patients than other subjects' placements did. She inquired about patients' interests (exchanging information), coaxed them to undertake craft activities (coaching and persuading), made small talk to lighten a trying situation (diverting, empathizing), etc. Perhaps it could be concluded that students should have been placed more with patients, that the placements themselves were not as varied interpersonally as they should have been. Still, the overall differences that were found between subjects' functioning with people in projects and placements compared with classes are important.

Parallel to these trends, subjects shared in, or fully controlled, the initiation and governance of their activity for progressively greater proportions of time between classes, projects, and placements. Initiation, as it is used here, refers to students' or staff's originating specific action or interaction sequences within a five minute time interval, rather than simply the initiation of the larger activity as such. For example, hospital staff might have asked a subject to conduct a certain set of tests with a urine sample. If the subject during a subsequent time interval was observed carrying out these tests entirely on his own -- reading a specific gravity index, comparing the color resulting from a chemical test with a chart of the colors of different possible reactions -- the subject was regarded as initiating these actions. If the subject questioned staff about the tests, the sequence might still have been coded as initiated by subject alone. If staff himself asked a question or made a verbal or nonverbal suggestion for the subject's actions, during an interval in which subject was also starting and stopping specific action sequences on his own, the initiation would have become joint between subject and staff. This measure of initiation in specific time intervals is closer to what is meant by "independence" in learning and work than a measure of the initiation of the more encompassing activities alone.

Subjects were overtly active during more than half of the observation time in classes (discussing, completing or checking a worksheet, etc.) which marks both the General Education and Environmental Science classes as more active than many. However, in Projects and Placements subjects were active during more than four fifths of the observation time.

The intensity of subject's attention or arousal to a task was clearly related to subject activity level. However, this was a deliberately more subjective, or inter-subjective, measure. Whereas activity level was based strictly on the proportions of a five minute interval that a subject was only attending, compared with exhibiting verbal or nonverbal activity, involvement was based on the focus or intensity of subject's gaze, the degree of feeling expressed in the voice, and/or the coordination and dimensionality of subject's movement in the direction of a task. Involvement was meant to be equally observable in attending to a lecture or demonstration, participating in a discussion, or pursuing a concrete task, so long as subject's activity was on task. Nonetheless, higher degrees of involvement were found in projects and placements than in either the General Education or the Environmental Science classes.

Virtually the only off task behavior that lasted long enough to characterize a five minute observation interval occurred in the General Education classes. Interestingly, it was observed in independent study activities not in lecture or discussion. Why this was so will be discussed later in the analysis of conditions associated with different high level or preferred subject behaviors. It should be remarked here that, the above contrast nowwithstanding, the involvement percentages for the classes too, seemed high in comparison to classrooms in many schools.

SUMMARY OF SOCIAL ENVIRONMENT

Overall the data showed that the subjects were not passive onlookers in projects and placements, but tended to be actively engaged in tasks in these settings, more independently in the placements than in the projects. Environmental Science resembled the General Education classes in being conducted modally in large group discussions, but with at least a moderate participation rate. Staff in projects and placements functioned at lower levels of power than staff in classes, in relation to subjects. Conversely, subjects in projects and placements functioned with people -- staff, patients, and peers -- at somewhat higher levels of power and complexity than they did in classes. Subjects participated more in the initiation of ongoing activity in projects and placements than in classes. It can be concluded that the projects and placements did have more of the co-operation that is attributed to non-formal educational settings. It could also be said that the social environments of the different settings of the program complemented each other, and that between them the students experienced and participated in a range of roles.

B. THE INTELLECTUAL ENVIRONMENT

One expects to find written data in use in a high school classroom setting at almost any time. Books and notebooks, worksheets, blackboard displays, maps, are classroom essentials. But how often will these or other written representations of data -- labels, cards, forms, dials and guages -- be found in use in non-formal, i.e. experiential educational settings? The findings show that written data sources were observed three quarters of the time in placements and four fifths of the time in projects. Written data were observed nine tenths of the time in classes. As is generally the case for these observations, the findings apply *not* just to data sources in the room where the subject was observed, but to those that were *active or being used in the immediate setting of the students' own attention or activity*.

The question of how participants in the observed settings were *operating* on data pertains to more information than was represented in the written data sources alone. The statements of participants, and the arrangements and workings of non-symbolic objects, also contribute to the data potential of a setting.

One aspect of this data potential is what SETH has called task novelty. Novelty was judged in fairly close relationship to the subjects themselves. If a subject had been in a placement for several weeks, the situation (people and things elements of the setting) and information (data elements) might both have become familiar to the subject by the time of an observation, though in relation to what high school students usually experience in school the situation might have been quite novel. It was, in this case, coded familiar situation and information. An example was a subject's using an earlier learned, now familiar classification scheme to file patient records. The highest proportion of familiar situation and information was observed in the Environmental Science classes, 40%. This reflected the fact that on three of the observation occasions the class was either reviewing for a test or going over a test already taken. This type of activity is overrepresented in the Environmental Science data, in view of what was informally observed on many other occasions. It obviously relates to the low levels of data functioning recorded for Environmental Science class, as discussed below. Familiar situation and new information, for example a discussion of new science information, was modal for all four types of setting alike, most strongly for the General Education classes. New situations and information combined occurred most in projects and placements, especially the former, where a quarter of the time observed involved such activities as the videotaping of an interview with a local storekeeper to document his knowledge of pollutants in his stock.

VALUE OF USING D.O.T. IN ASSESSING LEARNING BEHAVIOR IN FORMAL AND NON-FORMAL LEARNING SETTINGS.

Most educators are familiar with the six levels of *Bloom's Taxonony of Educational Objectives: note six levels of cognitive activity, knowledge retrieval, comprehension, application, analysis, synthesis, and judgment. The levels of data functioning recognized in the Dictionary of Occupational Titles presume a similar hierarchiacal structure, and run somewhat parallel to the Bloom levels. An advantage of using the D.O.T. scheme is the possibility of making direct comparisons between the data functioning of students and the functioning required in, or characteristic of, different occupations -- not just in anticipation of students' employment as workers, but to assess the educational value of the work settings.

The analysis to be reported here does not compare students performances with D.O.T. ratings of jobs, but it does compare students' levels of functioning with staff functioning during the time that staff were present in student settings. While the D.O.T. scheme was slightly modified to increase its application to the classroom, the resulting low, medium, and high levels of data functioning can still be articulated with the D.O.T. The SETH levels were the following:

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*Bloom, Benjamin S. et al Taxonomy of Educational Objectives: Handbook I: Cognitive Domain.New York: David McKay Co.,1965

Low:	comparing/retrieving; copying
Medium:	computing/applying an algorithm; extrapolating; compiling/classifying
High:	analyzing; innovating; coordinating; synthesizing.

Each level subsumes some operations from the level before. This means not just that computing involves retrieving, but that if analysis is reached during a computation, analysis can be coded as the highest level observed, subsuming computing. In the terms of the D.O.T. criteria, analysis would be involved when the consequences of different computational decisions were weighed, a type of data functioning that the SETH observers saw with some frequency in mathematics classes, for example. In the video project, to cite another example, analysis frequently subsumed classificatory and extrapolating operations, when the students examined various segments of tape to see how they related and how they might be combined in an edited tape.

It is assumed that an individual is always processing data, at least during the waking state, although this data functioning is not always externally available. Speaking, writing, and certain manipulations -- for example, sorting objects -- manifest one's data functioning. The SETH observers used as many contextual and nonverbal behavioral clues as possible to estimate the levels of data functioning in the settings observed. While this was not conservative, agreement between the observers was reasonably high.

The percentage of time intervals that the observers did not attempt to judge level of data functioning of subjects in different settings is reported in Table 2. It was lowest in

Environmental Science and in Projects, for different reasons. Subjects' attending to a test preparation or review, sometimes marking their own papers were often presumed to evidence the same thinking that peers and staff were manifesting almost continuously in this situation. In projects, subjects were overtly active most of the time, in addition to which a great deal of verbalization accompanied the activity. By contrast, while subjects in placement were active even more, they verbalized less, so that their data functioning was less accessible. In the General Education classes subjects attended more and talked less, and while there was much talk by others in the setting, its level of functioning often varied too much to permit inferences about subjects' level of data functioning.

One asks about staff data functions partly to know what levels subjects were exposed to and in some way attending to or interacting -- articulated with. In line with the hierarchical structure of the levels that was noted before, the observers recorded the highest level of data functioning staff reached during each five minute interval. This was done also for peers and for subjects. The highest percentage of medium and high level data functioning combined, 75% of total time, was recorded for staff in the projects. This was especially associated with the video project. Staff's medium and high level data functioning combined was manifested 60% of the time in the General Education classes, 44% in placements, and 39% in the Environmental Science classes. Reciprocally, low level data functioning was exhibited by staff the most in the

Environmental Science course, next most in placements and General Education classes, and least in projects. Calculating simply the ratios of high and medium level data functioning to all manifest data functioning, i.e., leaving out the time when staff were absent or their data functions were not manifest, 93% high or medium level functioning was found for staff in projects, 77% for General Education staff, 68% for placement staff, and 42% for staff in Environmental Science classes. In various ways, then, the order in which staff can be seen to have exhibited relatively high level data functioning, presumably to the subjects as well as to the observers, was projects, General Education classes, placements, and Environmental Science classes.

The highest level of data functioning manifested by at least one peer during a given five minute interval was the level recorded for peers for that interval. This represents the highest peer level subject was exposed to during that interval. Peers exhibited medium or high level data functioning 88% of the time in projects, 61% in the General Education classes, 27% in Environmental Science courses, and 5% in placements. The very low percentage for placements reflects the large proportion of time that peers were not present in placements, while the low percentage for Environmental Science, consistent with the low staff percentage in Environmental Science, must be attributed at least in part to the aforementioned test preparation and review during several observations.

Subject data functions were medium or high 80% of the time in projects, 47% of the time in General Education classes, 43% in placements, and 28% in Environmental Science classes. Calculating the ratios of medium and high data functioning to all manifest data functioning for subjects in each of the four types of settings, 87%, 63%, 57% and 31% were obtained for the projects, the General Education classes, placements, and Environmental Science classes respectively. Interestingly, these ratios are only between 6 and 14% less than the corresponding staff ratios in the four types of settings. The most parasimonious conclusion one can draw from this is that staff and subjects adapted to each other's data functioning in all four types of settings in the SETH program.

SUMMARY OF DATA FUNCTIONING OBSERVATIONS

In general, the subjects' levels of data functioning appear to have been higher than the level that has most frequently been attributed to students in conventional classrooms when Bloom's Taxonomy has been used to analyze levels of cognitive functioning, sheer knowledge retrieval or recall. The one exception to this is the Environmental Science classes, where, once again, the observations disproportionately represented test related activity, and underrepresented higher level data functioning that was often observed in informal visits to these classrooms. That the subjects' data functioning was so nearly comparable in the General Education classrooms and in placements is intriquing. Most of this functioning in placements took place in concrete tasks rather than in didactic discussion, and nearly half of these tasks were unsupervised. What difference the supervision made will be taken up later. The exceptionally high levels of subjects' and staff's data functioning in projects points to the possible effects of combining didactic and experiential aspects of activity. The high level of data functioning in the SETH settings overall, excepting the test sessions in Environmental Science classes, might be evidence that the formal and non-formal aspects of the program did reinforce one another as the program model projected. This cannot really be known without other settings for comparison. In any case, the substantial overlap between subjects' and staff's data functioning in both projects and placements implies that the subjects, and thus the students of whom they were a sample, were indeed exhibiting entry level cognitive skills for health environment careers. In the most literal sense, they entered into the data work of the project and placement tasks.

C. MANIPULATIVES IN THE ENVIRONMENT

Manipulative things other than writing materials -- simple objects like test tubes and bed sheets, and complex tools or machines like a microscope or video camera and recorder -- were rarely observed in use in the General Education classes, never were observed in the Environmental Science classes, but were observed being used three quarters of the time in both the projects and the placements.

When staff used objects, the level of their functioning with (these) things tended to be relatively high. This means that they were more often observed manipulating, operating -- controlling, and so on through setting up, the highest level of the D.O.T. job things functions analysis scheme, and less often just handling or tending things. Manipulating or operating video equipment, a microscope, a centrifuge, and tooth extracting equipment, were examples of this higher level things functioning. Student peers were infrequently present in placements, but in projects the modal level of things functioning that was observed for peers was also manipulating or higher, on those occasions when objects were in use.

Subjects themselves worked with things slightly more than half the time in projects, and three quarters of the time in placements, in both cases at low levels of things functioning more frequently than at high levels. While subjects did operate video and laboratory equipment approximately a quarter of the time both in projects and in placements, they were more often observed in actions like holding a mirror or a suctioning tube for a dentist, placing x-ray plates in a developing cabinet and later removing and posting the plates, holding a microphone during an interview, and so forth. As these examples illustrate, however, even the lower level things functioning tended to be central to the action in the subjects' setting.

The projects and placements clearly represented more of a "hands on" experience for the SETH students. That physical objects were involved in project and placement activity most of the time is in line with the characterization of these as non-formal settings, and raises questions about the interaction between things presence and other features of the settings, for example the uses of language and the levels of data functioning in these settings.

D. THE VERBAL ENVIRONMENTS OF SETH

The function of the VBI was twofold; to measure the soliciting and responding behavior of the observed subject as well as to record features of the verbal interaction as a whole in which the subject may or may not have been participating. While we coded seven features of the verbal environment, analysis of the data has showed five of these to be reliably codable, informatively associated with student output and useful in discriminating between the different learning settings.

These are --

continuousness of talk
percent of peer participating
task relatedness of talk
goal of talk
type of talk

(see appendix C for definitions of these descriptors)

These features of the verbal environment are considered to be comparable to the setting features described in the previous section -- e.g., size of peer cluster, interaction format, etc., in their potential for constraining or activating the behavior of the observed individuals. To broaden the data composite for understanding student behavior in different learning settings, the distribution of these five verbal environment variables across the program's four components, as are the descriptions, are the way rates of soliciting are distributed among the four components. An analysis of the setting features that are associated with the rates of soliciting occurs in a later section of the report.

Talk Continuousness:

In general, SETH students are exposed to a talk-filled environment. 'Continuous' talk occupies 58% of their time, 'sporadic' talk 35% of it and 'silence' only 7% of it. The continuousness of talk does vary markedly with the different components of the program. Continuousness, for example, dominates environmental science classes (89%) and general education classes (79%) but constitutes only 52% of the projects and 31% of the placements. Sporadic talk is the norm about half the time in projects and placement. Silence occupies 16% of the placement time but is negligible in both classes and projects.

Percent of Peer Participation:

This is an estimated measure of talk symmetry -- i.e., how talk time is divided between the adult(s) and student(s) in a setting. Program-wide, students (subject and whatever peers are present) occupy less than 10% of the talk time [illegible] of the time. They occupy between 11 and 50% of the talk time [illegible] of the time and they occupy more than 50% of the talk time [illegible] of the time.

When examined by concern, classes are found to be dominated by the middle (11-50) level, (43%) but have the low and high levels well represented, 35% and 22% respectively. Projects are dominated by the 51-100 level (51%) with 35% of the 11-50 level and only 14% of the 0-10 level. Placement, on the other hand, has 68% of its time in the 0-10% level with only 21% and 30% at the higher levels of student participation.

When correlations between peer cluster and % of peer participation are made, the high (51-100) level is found equally often in groups of 1-5 as in groups of 11 or more students. This is surprising since 11+ peer clusters tend to be in teacher centered classes and the literature reports that teacher dominated classes allow for relatively little student talk time. (Almost [illegible] of this 51-100 category does occur when staff is absent.) Corroborating this is the fact that very little of the 0-10 level is in the 11+ grouping. When large groups occur in the [illegible] program, the talk time tends to be evenly allocated between students and adults.

Interestingly, the 11-50 level of student participation is positively correlated with staff activity, but the 51-100 level is negatively correlated with the degree of staff activity. Apparently, very active staff behavior precludes student domination of the talk time but moderately active staff behavior does not.

Task Relatedness

Analysis of the task relatedness variable indicates a task oriented use of talk throughout the [illegible] program. 77% of the time students were exposed to talk that was 'highly related' to the prescribed task, only 12% of the time were students exposed to talk which digressed to related but relevant subjects and almost none (4%) of the time was the talk concerned with 'unrelated' matters. Task relatedness is distributed unevenly across the four major components of the program in that projects alone have a substantial share of the 'partially related' talk.

This fits with the fact that program-wide, the conditions that are most often found with 'partially related talk' are joint initiation, a peer cluster of 1-5, and an interaction format where subject and staff are collaborating on a task. The project component of the program has the highest concentration of all three of these conditions.

It is interesting to note here that when staff is absent, the talk still stays 'highly related' 90% of the time.

Goals

In terms of the goal of the talk that students were exposed to, the general education and environmental classes are set apart from both placements and projects in that they are dominated by talk that is explaining and demonstrating an operation or task or integrating the task with theoretical background information. In these uses of talk, referents are not in the immediate context and are usually 'ideas and concepts'. Placements and projects, on the other hand, while containing large percentages of these categories, also contain large amounts (about 45%) of talk that is asisting the performance of a manipulative task such as the assembling of a video porta-pack or the operation of a centrifuge. This kind of talk is highly context bound in that it requires the local context for its comprehension. The less context bound talk of the classroom does exist in placement but to a lesser degree.

Type: The distribution of various talk formats ('types') or ways of organizing verbal interaction - specifically the number of strands that co-exist - also varies with concern. Classes are 60% 'single strand' and 40% 'umbrella' type interactions; placements are divided between single-strand (largely dyadic) and multiple strand interactions while projects have all three of these types substantially represented.

In sum, the program as a whole provides a wide range of talk environments. This is an important feature both because of the increased opportunities for student verbal output such a range provides and for the opportunities to practice types of verbal interactions important to entry level communications skills development.

DISTRIBUTION OF SOLICIT AND RESPONSE RATES ACROSS THE FOUR PROGRAM COMPONENTS

Soliciting is the major focus of the project's research on SETH students' verbal output. The working assumption has been that the more soliciting a student does, the more control that student gains over the content and structure of his learning setting. Increased control is viewed as commensurate with a greater potential that the student will learn from the setting.

Studies of student verbal performance in traditional classrooms have revealed a preponderance of student responding over student soliciting. Studies of minority students' verbal output in schools have indicated that these students, because of different language competencies, very often require other than traditional educational settings to become verbally engaged with curriculum materials at all. This section of the report presents the quantity of soliciting and responding SETH students performed program-wide and how those quantities were distributed over the program's four components.

It is noted that 'rate' of soliciting is a measure of the number of solicits made by the subject per five minute observation segment and says nothing about the quality, addressee or topic of the soliciting.

Program-wide: On program-wide basis, there is more time spent in soliciting than in not soliciting; 58% vs. 42%. However, the segments with a lower rate of soliciting (1-3) exceed those with a moderate rate (4-6) which in turn exceed those with a high rate (7+). The percentages are respectively, 37%, 12% and 10%. Thus the modal rate for SETH students is between one and three solicits every five minutes.

The picture for responding is important in that it shows less responding than soliciting -- there are more segments with no responses than there are with no solicits and fewer of the segments have moderate or high rates of responses than have moderate or high rates of solicits.

V

Intra-program differences: The environmental science setting of the four components of the program are most conducive to soliciting. Table shows that the environmental science settings contain the lowest proportion of segments with no soliciting and the highest proportion of segments with higher rates of soliciting. Both the environmental science project component and the environmental science classes have higher rates of soliciting at the 4-6 rate than the general education classes. It seems that the environmental science curriculum taught in both the traditional recitation format and in the more experiential format of the projects are activating relatively high rates of soliciting.

What properties of the SETH settings were associated with subjects' greater involvement, higher levels of people, data and things functioning, and more frequent soliciting? Answer to this question would clearly be useful for the design and modification of environmental education programs. They would further understanding of experiential education more generally.

It must be stated again that the data does not readily lend itself to tests of significance. At the same time, it has been examined cautiously. Relationships, for example between subjects' data functioning and the level of activity of staff, will be presented here as stronger when they have been found to be associated in a given direction across classes, projects, and placements alike. Where a relationship is not as clearcut as this, but a meaningful pattern can still be discerned, it will be presented as such.

F. What conditions were associated with subjects' higher level functioning with people? Many factors seem to enter into the occurrence of subjects' higher level functioning with people, especially their functioning at the highest level, spanning the functions of serving (in tending a patient, for example) through instructing (which more than one subject did with patients or visitors in placements). To begin, staff's functioning on a high power level, usually instructing, pretty well excluded subjects' functioning on a high level. Subjects were most likely to function on a high level if staff's power level was low, though medium staff power was also found with high student power, and staff absence too was found with high student power. In the last case, it was obviously peers, patients, or visitors with whom the subjects were functioning at this high level.

Another analysis shows the same thing by a slightly different route. Subjects' highest people functioning was found in tasks that were supervised by co-operative with staff, followed by independent tasks, i.e., those that were not staff supervised or co-operative with staff. Discussion formats involved relatively little highest level functioning by subjects, though, quite expectedly, they contained the most middle level people functioning by students, exchange of information. Low level functioning predominated in lectures and demonstrations.

Finally, independent activities, where staff was essentially absent, tended to be polarized. If no one else was present in the setting (except the observers), people functioning was simply not applicable. If peers, patients, or visitors were present, then subjects' people functioning tended to be high.

Not surprisingly -- but worth taking note of in its implications for the design of educational settings -- high subject people functioning occurred three times as much when there were no peers, 1-5 peers, or 6-10 peers -- any of these -- than when there were 11 or more peers.

Also no surprise, subjects' high people functioning occurred most in settings where the subjects were active most of the time.

The sheer presence of manipulatives in a setting also had no bearing on subjects' people functioning. However, subjects' actual functioning with manipulatives did relate. Subjects were most likely to function at the highest level with people if they were also functioning at a relatively high level with things, for example in videotaping, occupational therapy, and emergency laboratory. Conversely, they were least likely to function at a high level with people if they were not functioning with things at all. This provocative finding, suggests that functioning with things, especially at higher levels, mediated subjects' articulating with other individuals. Thus, it fits into the general picture of the non-formal educational setting, in which the reduced discrepancy between the power of the teacher and the learner, the lesser social distance, is a function of their mutual relationship to the task in which they are engaged, usually a concrete task involving things.

G. What Conditions Were Associated with Subject's Involvement? It was seen before that involvement was judged to be considerably higher in projects and placements than in the classes. However, it was sometimes higher in classes than at other times, and likewise sometimes lower in projects or placements than at other times. The question here is what conditions were associated with higher involvement in classes, projects, and placements alike? Involvement and soliciting tended to be related across all settings, though in classes both off task behavior and highly involved behavior were associated with high soliciting, the former directed more toward peers alone and the latter toward staff and peers.

Overall, subjects' involvement was recorded as lowest during lectures and demonstrations, higher during discussion, and highest during supervised and unsupervised tasks. Thus a subject's simply watching staff function in a hospital setting was no more involving than attending to a lecture in class. This partly reflects a bias of the involvement measure toward overt activity. An interesting exception to this is that in their classes subjects tended to be less involved in supervised tasks than in lecture-demonstration or discussion. The reason for this appears to be that staff were elsewhere in the room vis-a-vis a given subject, while subjects were not provided with high feedback materials that would sustain their engagement in the absence of staff, but instead had to concentrate on books and academic worksheets. In the projects and placements subjects typically had more operative feedback sources -- or, as noted above, people, data, things to function with in clearly defined ways -- when staff were absent from the subjects' immediate vicinity. Further, the project and placement staff tended to be more available to the subjects during supervised tasks, or actually to cooperate with the subjects in a shared task. The most conspicuous factor affecting this was the presence of fewer peers in the project and placement setting than in the typical class settings. As seen before, subjects tended to function at high levels with people more in projects and placements than in classes, and this high people functioning, in turn, was most often rated high for subjects' involvement.

High involvement was also associated with the presence of things in the placement settings, though in the project settings, where staff were usually present and active, the presence or absence of things in the settings did not make a difference to involvement. Subjects' functioning with things was associated with high involvement in both projects and placements. (It will be remembered that things were virtually never observed in use in classes.)

In classes, placements, and projects alike, involvement was associated with novelty. Familiar situations and information combined evoked the least involvement, and new situations and information combined evoked the most. Further, involvement was positively associated with subjects' high data functioning across classes, projects, and placements.

It is of interest that involvement was not consistently related to staff's level of data functioning nor to the number of student peers present with a subject at a given time, except, again, in the simple contrast between subjects' fewer or more than 11 student peers.

The most general conclusion to be reached is that involvement was found most in those settings where interactions with people, data, or things produced task-related feedback. In the case of people and things, higher level functioning or interaction generated this feedback. With respect to data, if things and people were not a part of the activity, it was important that the data sources operated on be a part of a data system, for example a filing system, rather than a sheer data statement, as in the case of a self-contained reading or writing assignment.

H. What Conditions Were Associated with Higher Levels of Subjects' Data Functioning?

A medium degree of staff activity in relation to a given subject -- staff relating to subject for part, but not all of, a five minute interval -- was associated with subjects' higher level data functioning across classes, projects, and placements. Staff's operating at higher levels of data functioning was found with higher level subject data functioning across classes, projects, and placements. Subjects' soliciting was associated with higher level data functioning strongly in placements, to a lesser extent in classes, but not in projects.

Overall, i.e., pooling the data from the different settings, initiation that was joint between subject and staff, and tasks that were supervised or cooperative with staff, showed the highest levels of data functioning by subjects. There were departures from this generalization within setting types, however. What remains clearest is that lower subject data functioning was consistently found with initiation by others -- staff and/or peers, but not including subject -- and with lecture or demonstration, yet at the same time the highest levels of subject data functioning were always manifested in situations where staff were present.

The interrelationships among subjects' people functioning, staff's people functioning in relation to subject, and subjects' and staff's data functioning were complex. Subjects' data functioning tended to be higher when their people functioning was higher. More explicitly, if one combines middle and high level data functioning and contrasts this with low data functioning or data functioning not manifest, or if one contrasts the two higher levels simply with the lower manifest level -- the pattern turns out to be similar both ways -- subjects' higher data functioning so defined was more likely to occur with subjects' high or medium people functioning than with their low people functioning or not functioning with people at all. Still more explicitly, across all three types of settings, classes, projects, and placements alike, these higher levels of subjects' data functioning were equally associated with subjects' medium and high level people functioning.

With regard to staff people functioning, however, somewhat higher levels of both subjects' and staff's data functioning occurred when staff related to subject in a high power role, lecturing or demonstrating then when staff related in a medium or low power role. This was true both in projects and in placements, where the only significant proportions of staff's low power people functioning were observed. These episodes of staff lecturing or demonstrating were relatively brief, and usually alternated with, or were situated in, subject's activity supervised by, or cooperative with, staff.

The picture this all suggests is facinating. It shows staff modeling higher level data functioning, and simultaneously sharing control of activity with subjects, in those settings were subjects' data functioning was higher.

Staff moved in and out of subjects' activity, or subjects approached and withdrew from staff, often in connection with subjects' soliciting. Many examples could be cited. Staff and subject observed in the Emergency Room Laboratory frequently traded questions and comments about the progress and outcomes of each other's tasks, different analyses of blood and urine samples. In video, students and staff regularly exchanged analyses of the tapes they were making. Subjects' data functioning tended to be lowest under two conditions: when staff was present, but the interaction format and/or the number of peers present restricted the opportunities for students to manifest their data functioning, and when staff was absent. The latter situation, which occurred most frequently in placement, may have reflected no more on the ability of the students than on a reluctance of the hospital to delegate higher level tasks to students working in staff's absence. The fact that higher data functioning was associated most strongly with subjects' verbal soliciting in placements suggests the key part that students themselves played in accessing information, especially where staff were not teachers and thus, as in projects and even more in classes, expected to set up the data functioning for the students.

I. What Setting Properties Were Associated with Subjects' Things Functioning?

Subjects were more likely to be observed functioning with things at all, as opposed to not, in supervised or unsupervised tasks with relatively few or no peers present. They were more likely to function with things at higher levels in activities in which staff cooperated with subjects in a common task, a subset of the supervised tasks. These findings, slim as they are, do fit what one would expect from the characterization of learning in formal and non-formal settings that was presented at the outset. They raise the question of how talk continuousness was associated with things, which leads to the next section of analysis.

J. Conditions Associated With High Rates of Subject Soliciting The Social Environment

Peer Cluster: 7+ soliciting is equally well represented in settings with 1-5 peers, 6-10 peers and no peers while the 4-6 rate of soliciting is equally distributed between all peer cluster conditions. In other words, by itself, this variable does not seem to have predictive power. In classes, surprisingly, 7+ soliciting is most frequent in groups larger than 6 and all other levels of soliciting are much better represented in the 11+ peer cluster size. This would suggest that in the classroom, tutorials and small group activities are not helpful in producing high level soliciting. There are several possible explanations for this; one -- that such groupings may be designed by the teacher for the accomplishment of individual reading and writing assignments rather than group oriented problem solving sessions and two -- that the availability of the teacher as a solicitee is probably cut down when students are grouped, for she is most likely to be with another group. /

In projects as well, where smaller (1-5) groups are the norm, the higher rates of soliciting still stay with the 6-10 grouping rather than with the 1-5, though low rates of soliciting and zero soliciting is found much more with the smaller groups. In placements, all rates of soliciting are predominantly in the 'no peers' condition even though about 25% of the time there were peers with subject on placement. It is significant and interesting that peers did not interact with each other in hospital staff's presence. Implicit knowledge of the code switching required in switching addressees accompanied by a lack of competence in this kind of switching may have contributed to this situation.

Interaction Format: Supervised task seems to be the most favorable condition for soliciting in general; it has the lowest percentage of zero solicit segments and the highest percentage of 1-3 and 4-6 solicit rates. The differences are not great however -- both 'lecture - demonstration' and 'discussion' are close behind.

'Supervised task' has a stronger relationship with soliciting on project than on placement and an even less strong one in classes. The explanation for this undoubtedly has to do with the nature of the 'tasks' (see above p.54) which in placement must seem more 'important' in that they are 'real work' and not the 'practice' work that classroom tasks so often are.

'Lecture-demonstration' in placement, where it is usually done in a tutorial framework, does not encourage more soliciting than it does in classes. It would be interesting to investigate what inhibitors are preventing more interactions between students and hospital personnel during these didactic sessions.

Source of Initiation: Situations in which the subject initiates with peers, a condition that occurs infrequently and mostly on projects, is the best condition for high rates of soliciting. 'Subject initiating with staff' is the next best. When subject alone initiates, zero solicits predominate in all settings (probably because subject is alone). This is also true when 'other' initiates, but in this case it is probably accounted for by the fact that this condition occurs most frequently in class where talk opportunities must be shared with a larger number of people.

Staff People Functioning and Activity Level: Both moderate and high levels of staff activity are more conducive to high level soliciting than low staff activity is. However a lot (28%) of the 7+ soliciting also exists when staff is absent suggesting that this soliciting is among peers. This finding is paralleled by the relationship between soliciting and Staff People Functions. All levels of soliciting except the 7+ are higher when staff is in a highly controlling role with subject and descend evenly as the staff role becomes less controlling and finally non-existent. As in the 'activity' relationship mentioned above, there is a substantial portion (32%) of 7+ soliciting done when staff is absent. We will have to assume this is inter-peer soliciting.

The Intellectual Environment

Novelty of Task: There is no discernible relationship between rates of soliciting and this variable, but it does seem to be related to the presence/absence of soliciting. In the 'familiar situation and information' condition, the zero solicit behavior pertains 65% of the time. In the 'familiar-situation-new-information' condition, zero soliciting pertains only 40% of the time. Thus as novelty increases, so does soliciting.

Staff Data Functioning: Program-wide, higher rates of soliciting occur most often when staff is at the middle level of data-functioning -- soliciting drops off when staff functions at the highest level.

This relationship varies with concern and does so confusingly as the following table shows.

TABLE 3
Relationship between staff data functioning and subject soliciting.

		Low Staff df.	Mod. Staff df.	Hi Staff df.
% of time at / higher rates of sol.	class	17.6%	15.9%	22.2%
	proj.	67%	46%	9%
	place.	2.4%	21.5%	17.2%

The strongest relationship between high staff data functioning and higher (4-6 and 7+) soliciting is in class and the next strongest is in placement while in project there is a clearly inverse relationship between solicit rate and level of staff functioning.

It is possible that in project where students are dealing with familiar school personnel in a somewhat 'freer' atmosphere, the students might be asking low level questions to which the staff are adapting, thereby being responsive to the students but also depressing the staff data functioning level. On placement, because of perceived status differences or simply a relative lack of familiarity between students and staff, students may not 'dare' to ask what they call 'dumb' questions. Other possible explanations might focus on the relatively lower amount of staff control that exists in project and the relatively larger amounts of task oriented context bound talk and partially related talk. On projects, talk is apt to be student controlled (% of peer participation is 51% - 100% a lot of the time) and multiple stranded and these qualities may mitigate against it adapting to staff's data functioning level.

The Physical Environment

Existence of manipulative and subject things functioning: Overall, the cross-tabulations indicate that the presence of manipulatives discourages the highest level of soliciting but encourages the lower two levels of soliciting. There rarely are any manipulatives in classes, but in projects and placements where there exist manipulatives 3/4 and 4/5 of the time respectively, they seem to have two different relationships with soliciting rate. In projects, the existence of manipulatives dampens the rate of soliciting (except at the 1-3 rate) and in placement it increases it (except at the 7+ rate). This difference between project and placement is corroborated by the fact that there is no relationship between subject things functions and solicit rate in projects while there is such a relationship in placement -- the higher the subject things function, the higher the solicit rate. Another supporting fact is the goal-solicit relationship. Both 'assist manipulative' and 'explain demonstrate' goals exist on projects but high solicit levels are associated only with the latter. The project trend may be due to the fact that the manipulatives there are more routine and do not require verbal explication. For instance, the video receiver as a manipulative, but when students are watching the replay of a tape, it is not stimulating soliciting.

The Verbal Environment

Continuous talk is the more conducive to 7+ and 4-6 soliciting than sporadic talk is. This seems almost self evident and is somewhat muddied by the fact that soliciting and continuousness are not independent of one another -- each solicit contributes to the continuousness of the verbal interaction. The finding has some interest, though, in light of the conventional assumption that students question infrequently because they can't find a way into the conversation or because they are bored by constant verbal streams.

Percent of Peer Participation: 63% of the 7+ soliciting is done when the percent of peer participation is between 51% and 100% but interestingly 4-6 soliciting is found almost equally in all three levels of peer participation. 1-3 soliciting is found most when peer participation is low (0-10%). In both projects and classes, the higher the share of talk time students have, the higher is the subject's rate of soliciting. On placement this trend is not clear -- largely because there are very few occasions on placement where peers do dominate the talk time.

Task Relatedness is an interesting variable in that the category 'partially' related is the most favorable to high rates of soliciting. 28% of this kind of talk includes the subject soliciting at the 7+ rate while no more than 9% of any other kind of talk contains 7+ soliciting.

'Partially related' talk occurs mostly in projects which is where the most soliciting occurs. It also occurs substantially in one of the general education classes -- English -- which happens to be the class with the most 7+ soliciting. Even on placement where there is little 7+ soliciting and little 'partially related' talk, the intersection of these two categories suggests it is the most favorable kind of talk for high rates of soliciting.

It should be noted that program-wide, 'partially related' talk is highly correlated with involvement as well as with higher subject data-functioning. (59% of it occurs when subject is at high or moderate levels of data-functioning.) It also co-occurs with high student participation -- exactly half of all the 'partially related'talk occurs when students dominate the talk time of the interaction. This is in contrast to 'highly related' talk which is concentrated in the 0-10% bracket, when staff dominates the talk time. It should not be thought that student participation takes the talk off the subject -- 'unrelated' talk is also concentrated in the low (0-10%) bracket and when staff is absent, 'partially' and 'unrelated' talk together comprises only 13% of the segments.

It may be that 'partially' related talk represents an important type of adaptive interaction where participants are attempting to make the talk topic relevant to their experiences. The fact that it never occurs with hospital staff might reveal an important difference between the hospital staff and school staff's ability to communicate content material. Hospital staff may be less able to accommodate student efforts to weave anecdotal and personal material into content presentations -- efforts that may be essentially to their comprehension of the material. It also may reflect the fact that peers can only generate 'partial' talk when they constitute a critical mass -- say at least five.

The Goal of the interaction as a whole that is present most often with high soliciting in projects and in classes is 'explain-demonstrate'. This corroborates the finding described above that in projects the existence of manipulatives dampens soliciting as in projects, the 'assist manipulative' category -- the one which presupposes the existence of manipulatives -- is not associated with high rates of soliciting. In placements however, 'assist manipulatives' and 'future-past' is most often found with high rates of soliciting which in turn corroborates the finding reported above -- that only in placements does the existence of manipulatives relate to high rates of soliciting.

The type of interaction most favorable to both 7+ and 4-6 soliciting is one with multiple strands, where a participant can move around the working area entering a series of different converations. This situation occurs in projects when students are working independently and have need to consult different peers and staff members to complete their tasks. It also occurs in the hospital when students work alongside individuals who are pursuing separate but related tasks. It is easy to see how this is the easiest condition in which to perform solicits as there are presumably fewer constraints on choice of addressee, form of solicit and topic of solicit. It is the condition, one would suppose, that is least apt to occur in traditional classroom formats.

Addressee: VBI coders did originally notate the addressee for subject utterances but for the computer program we condensed this information so that addressee is presented for both the responses and solicits in a five minute segment. Thus if a response was made to an adult and four solicits made to a peer, the computer program would present the addressee for that segment as 'adult' and 'peer' losing the information that the peer was the addressee for the solicits and the adult for the response. Even with this problem, the distribution of addressee is interesting and shows a clear tendency for higher soliciting behavior to occur with 'peer' as addressee. The lower the rate of solicits, the more apt is 'adult' to be the addressee. This of course makes sense considering that high rates of soliciting go along with the 'multiple strand' interactions in peer group sizes of 1-10.

K. The Co-occurrence of Soliciting and Other Preferred Behaviors

Soliciting and Involvement: High rates of soliciting occur when students are 'highly involved' in the ongoing task and they are found less frequently as involvement level descends. Since soliciting is an index of involvement for the SBI coder, these two variables are not completely independent. Nevertheless, the association of these two learning behaviors makes a powerful learning tool and conditions that stimulate their teamwork are conditions that should be identified for replication.

Soliciting and Subject Data Functioning: Given the assumption that verbalization is a central learning tool, an ideal learning situation should be one in which a student is functioning at a high cognitive level and is verbally interacting with the material he is functioning with. Thus one very much wants to know how often high subject data functioning coincides with the existence of soliciting and where, in the program, this combination of behaviors occurs.

Program-wide, there is a positive relationship between rates of soliciting and subject's data functioning. This means that as the data-functioning level of the subject moves up from 'comparing', 'retrieving' and 'copying' (low) toward 'analysing', 'innovating', 'coordinating' or 'synthesizing' (high), the proportion of segments with zero solicits decreases and the proportion of segments with solicits increases. This is true for the 1-3 and the 4-6 rates of soliciting but true for the 7+ rate only through the middle level ('computing to classifying') of data functioning. In fact, in the 27 segments where subjects were functioning at the highest cognitive level they were most apt to solicit at the 1-3 rate and least apt to solicit at the 7+ rate. (This may indicate that most 7+ soliciting is in fact questioning of a low cognitive level or that high level questions get long answers which cut down on the rate of questioning possible, or that it is difficult to encode into language the 'frontier' or 'cutting edge' thinking that high data functioning represents.

In any case, even with the limited contribution of 7+ soliciting, the progression of higher (4-6 and 7+) soliciting looks as follows:

TABLE 4
Relationship between subject data
functioning and subject soliciting.

	Low df.	Med.df.	Hi.df.
% of time subject solicits at the 4-6 or 7+ rate.	13.8%	29.1%	33.3%

In looking at the soliciting behavior which goes with highest data functioning, it is interesting to see that in classes and projects only 11% of the segments where subjects are thinking at the highest level contain either 4-6 or 7+ soliciting while on placement 87% of the segments with highest subject data functioning contain these higher rates. (78% of these are in peer cluster groups under 10, 89% are when the talk is highly related and 78% are in a format where there is a task being accomplished in cooperation with staff.) Not only does this indicate something important about the nature of interactions on placement but it also indicates that the extensive 7+ soliciting behavior observed in projects probably does not have a role in the important overlap between staff and subject data functioning found exclusively on project. This hypothesis is further supported by the fact that high staff data functioning on project is inversely related to the proportion of time subject spends at high rates of soliciting there.

When the moderate level of data functioning is added and the same calculations are made, the positions of placement and project change. In 37% of the segments where subjects are at the moderate or high level of thinking in projects they are soliciting at one of the higher two rates. On placement the percentage is 29% and in classes it is 23%, (90% of these are when peer cluster size is under 10, 47% when subject is in a task with staff and 73% when the talk is 'highly related'.) (keep these tables with printout)

To summarize, in the SETH program, for better or for worse, moderate rates of soliciting seem to be the natural accompaniments to high subject data functioning.

L. The Apparent Effects of Reading Level

Program-Wide: Built into our design was the idea that different setting features might interact with students differently on the basis of grouped learner characteristics; particularly -- ethnicity, gender, locus of control and reading level. Of these four, only reading level seems to have an effect on the interactions between solicit rate and the various setting and behavior variables discussed so far. In the following discussion, 'high' readers refers to the seven subjects who scored either at or above the 8th grade level on the Metropolitan Reading Test (advanced) administered in September of 1976 and the term 'low' refers to those seven subjects whose scores were below 8. (none were below 5)

Overall, low readers solicited more than high readers did; more of their observations contained high rates of soliciting and fewer of them contained 'zero' soliciting.

The distribution of solicit rates for the two groups is interestingly different. Low readers did their high rates of soliciting in class and in projects (47% in each) and high readers did almost none of theirs in class and almost all of theirs (70%) on placement. The soliciting that the low readers did do on placement was dominated by the 1-3 rate while the same was true for the soliciting that the high readers did in class.

Certain situation-specific considerations may have influenced the difference between the soliciting behavior of the two groups in classes. The low and high readers were divided not only by test scores, but, as it happens, by social group. Almost all of the low readers were from Franklin while the highs were from Brandeis.

Unfortunately the distribution of the two groups between project and placement was extremely uneven -- only one high reader was in project and only three low readers were in placements. To a certain degree this may reflect choices affected by learning styles and goals characteristic of the two groups but largely it is a function of program history. The low readers (students from Benjamin Franklin) had been in the program for several years, had experienced the placements and therefore tended to choose the new program offering -- projects. In any case, this distribution fact does not affect a comparison of the groups' performances in class, though it does limit our ability to make comparisons between the different effects of project and placement. To remedy this problem, our effort has been to isolate some of the setting and project variables that are distributed fairly evenly across project and placement and then see if the soliciting behavior of the two groups is differently affected by these variables.

M. Relationships With Certain Setting and Behavior Variables

Interaction Format: High readers do 65% of their 7+ soliciting in the 'unsupervised task' condition while low readers do none in that condition. They do all of theirs in 'discussion' and 'supervised task' conditions. At the 4-6 rate, low readers still prefer the lecture and discussion formats over the task oriented situation which the high readers find more conducive to their 4-6 soliciting. The 1-3 rate is not affected differently for the two groups.

Type of Verbal Interaction: These tendencies are interestingly complemented by the findings on the different effects of 'type' on the two groups; low readers prefer, for the higher two rates of soliciting, the 'umbrella' and 'single' types of interaction which tend to go with the more traditional, teacher centered and teacher controlled settings. High readers, on the other hand, prefer the 'multiple strand' interactions more typical of work settings, at least the collaborative, problem solving, small group variety found in the SETH program, for their higher level soliciting. It looks as if the high readers may be able to adapt their interactive competencies more easily to the work settings than the low readers can.

Task Relatedness: Surprisingly, there is no finding that low readers prefer partially related talk as a condition for soliciting more than high readers do. When it is available to high readers, they also solicit at a higher rate. 'Partially related' talk does not exist at all on placements when staff is present, an interesting differentiator between school and hospital staff styles, and high readers' superior soliciting performance in its absence may reflect their superior adaptiveness to the different interactive styles of the hospital staff.

Peer Cluster: High readers are in situations with no peers more often than low readers are -- 38% of their total program time versus 20%. Such situations are more apt to produce 7+ soliciting for them that they are for low readers. It also looks as if larger peer groups tend to activate higher rates of soliciting for low readers than they do for high readers.

Subject Things Functioning: High and low readers are exactly the reverse of each other in terms of the relationship of their highest solicit rate and 'subject things functioning'. For high readers, 7+ soliciting goes with high things functioning and decreases as subject things functioning descends. The case for low readers is just the opposite. Most (68%) of their high solicits occur when their things function level is zero and as things function increases, their 7+ soliciting decreases. For the lower two rates of soliciting, the contrast between the groups breaks down -- for both of them, the higher the things functions, the more the soliciting.

Subject Data Functioning: It is interesting that these two groups who test and perform at very different achievement levels are virtually equivalent in the proportion of time they operate on high, moderate and low data function levels -- approximately 30% of the time at low, 43% of the time at moderate and 5% at high.

As described above, there is a program-wide relationship between the frequency of high solicit rate and high subject data-functioning. In classes this relationship is stronger for low readers than it is for high readers in that it includes many more instances of 7+ soliciting for the lows than it does for the highs. On placement, the opposite is true -- the high readers have a much stronger association between the frequency of high solicit rates and high data functions. The three low readers who were observed on placement do what little soliciting they do there during low and moderate data-functioning and when they function at a high level they do not solicit at all.

Staff Data-Functioning: In class, the high readers do almost no soliciting at the higher rates, but they do solicit at the 1-3 rate. However, the higher the staff data-functioning level is, the less of this soliciting occurs./ Low readers have a different pattern in classes. Both their 1-3 soliciting and their 4-6 soliciting increases as staff data-functioning rises. Most of their 7+ soliciting occurs however, when staff data-functioning is not observable indicating that this is probably intra-peer talk not directly concerned with peer-staff relations.

There is only one high reader on project so comparisons there are not possible.

On placement, most of the 7+ soliciting by the high readers is done when staff data-functioning is not discernible indicating that staff is not relating to subject at these times and the soliciting is directed to patients or co-workers. There is no relationship between soliciting at the other rates and staff data-functioning. The low readers do almost no 7+ soliciting on placement and at the other rates their amounts of soliciting is related to the level of staff data-functioning. Because of the finding reported above, that low readers on placement solicit only when they are at a low data functioning level, it seems likely that this soliciting that occurs when staff is functioning at a high level is for clarification, on another topic or in some other way not interactive with staff's level of data functioning.

Summary

The overall picture leads us to hypothesize that perhaps low readers use their verbal inquiry and control competencies in the more school like settings where -- the verbal channel is central, the adult is in a controlling role, there are a group of peers present, there are not complex manipulatives -- and additionally that low readers may not be as adaptive as high readers to non-school verbal games and in verbally interacting with non-school adult personnel who are not themselves practiced in interacting with the sociocultural group the students belong to.

We cannot, of course, specify the nature of these competencies/non-competencies or this adaptiveness/non-adaptiveness until we can look at the quality as well as the quantity of the solicits that are performed under the various conditions.

The important point is that characteristics such as reading ability may delimit the appropriateness of non-formal models or dictate ways in which those models should be tailored by staff and/or student training to maximize student performance and learning.

N. GENERAL SUMMARY OF ANALYSIS OF CONDITIONS ASSOCIATED WITH HIGHER LEVEL PERFORMANCES

The simplest, most general conclusion is that subjects functioned at their highest levels when staff alternated between didactic and enactive roles, in supervising, or engaging students co-operatively in, operational tasks. These optimal staff roles were open to subjects' soliciting, and were adapted to students' competencies and knowledge. This was reflected in the overlap between staff and student people, data, and things functioning, in the medium intensity of staff activity and the joint initiation that characterized the highest levels of both soliciting and functioning, and in the association of students' soliciting with "partially related talk," *i.e.*, talk that was an accommodation between the main goal of an activity and students' information and interests.

The obverse of this is that students too played a part in producing higher levels of functioning, by their making the accommodations that resulted in partially related talk, and by their verbal soliciting, especially in the placements where staff might have been less likely, at least in their official roles, to exploit the learning opportunities for the students.

Things were indeed present more in projects and placements than in classrooms, but their presence did not have consistent relationships with subjects' soliciting or data functioning. Students' familiarity with these things or with the results they produced varied between projects and placements, with variations in soliciting and data functioning accordingly. Things did enter into a larger pattern: the importance of operatives -- people, data, or things that could be functioned with to yield meaningful results, or results with feedback -- in sustaining students' activity during time intervals when staff were not present to supervise or respond to students. The combination of medium intensity staff activity and the presence of operatives occurred most often in projects, and suggests an interpretation for the particularly high levels of student performance observed in projects, the intersect between formal and informal education that was diagramed in the first section of this report. It must be stressed, however, that this optimal combination was observed at times in the classes as well, and most of the time that staff were present in the placements.

Not only were physical objects used almost as much in projects as in placements, but talk continuousness in projects was intermediate between classes and placements. This conforms further to the expectation that projects would combine the properties of formal and non-formal settings. A question is raised, however, by the fact that the goal of talk was categorized as "theoretical" for the same proportion of time, 23%, in the projects and placements, while it was theoretical 40% of the time in classes. Should not projects have been intermediate between classes and placements in this important respect, *i.e.*, would not teachers (the project staff) have capitalized on the theoretical implications of the tasks more often than hospital staff?

Of course, since talk continuousness was considerably higher in projects than in placements, the actual amount of theoretical talk was proportionally higher. Another side to the question, however, is that theoretical talk may have occurred more often in the students' placements than the concept of non-formal had led these investigators to expect. Perhaps especially because Mount Sinai is a teaching hospital, there were frequently theoretical discussions among staff in the presence of students, for example when a supervising dental surgeon discussed with a dentist in training an operation in which a SETH subject was assisting. Further, on several occasions the observers noticed hospital staff stepping up the teaching role after the first 10 minutes or so of an observation, or during a lull in the activities of the placement. This suggested an unintended effect of the observation procedure, the communication to hospital staff that they were now accountable for both their medical practice and the students' education. This was, however, a matter of degree rather than of kind. There were various evidences that most of the placements had been carefully selected and managed to be optimally productive for students. Again, the students' own questioning, together with staff's openness to it, contributed to the placements' educational value. Finally, a few placements actually created tasks for the students, for example, learning to recognize different bacteria with an electronic microscope, rather than relegate the students to assignments that were too passive, repetitive, or undemanding.

The major issue in placement -- indeed, seems to be the potential conflict between accountability to the students and accountability to the unit's standards. In the clear majority of cases observed at Mount Sinai, a good accommodation appeared to have been reached. There were some cases, however, where the match seemed less than satisfactory. In x-ray, for example, a subject spent most of the time during the observation following the technician around, watching the technician's positioning the patients and operating the machine, later listening to staff discussions of x-rays as they were posted, but only being asked, or allowed, to insert the plates in a developing cabinet and later remove them for posting (technicians inside the cabinet did the actual developing). It seemed to the observers that either the assignment should be designed to incorporate the subject more in the unit's activities, or, if this could not be done without compromising the standards of the unit, then a different placement should be found. The subject, however, reported that he learned much just from observing in this placement, and in fact was influenced by it to choose an x-ray technician's career. Would it have been still more valuable if, like most of the placements, and like the projects, the x-ray placement had been more of a hands-on experience? The question is unanswerable without a more extensive, especially a longitudianal, study. All of the basic indices in the present study, however -- involvement, levels of people, data and things functioning, and soliciting -- point to the value of combining the didactic and the active experiential components of the learning environment. At the least, it can be asserted that the projects, and in most cases the placements, promoted the behaviors that the SETH Environmental Health Program stipulated would evidence students' involvement in situations where health problems were being dealt with, and their developing entry level skills for medical and environmental health careers. A larger possibility, which further research will have to pursue, is that SETH enhanced the general quality of its students education, especially their learning about learning, through the interplay of its formal and non-formal settings.

PROPOSED REVISION OF THE DATA COLLECTION SYSTEM

Much has been learned about the data collection value of complementary data gathering techniques which has been confirmed in this study. The components needs to be more carefully articulated in future research. The discussion here will suggest a revised system to be used in future related research.

Debriefings

While all subjects were interviewed at the end of the year, debriefings following observations were more irregular. The new observation schedule that is anticipated (see below) would probably not permit debriefings of every student observed after every observation, but at least a systematic proportion of observations should be followed by debriefings, at times arranged later on the days of observation. Certain judgments can probably be made better by the subjects than by the observers, for example the relative familiarity or novelty of setting and information. The researchers will want to know what the subject experienced as most problematic, uncomfortable, or frustrating, as well as what was most interesting or satisfying. What the subject was thinking at times when data functioning was not manifest will concern the observers, and what levels of functioning, on the part of self and others, subject was aware of, continues to be of great interest.

Test and Questionnaires

The administration of academic achievement tests at the beginning and end of the current year was satisfactory. However, the Work Environment Scale was administered at a time when students were strongly feeling other pressures. This was one reason entering into the use of the short form, another being the researchers' underestimating the potential of the WES. It is urged that time be carefully planned for at least one administration of the long form of the WES in a future study.

The Nowicki-Strickland Locus of Control Instrument was used to stratify students as relatively external or internal for the selection of the observation subjects. However, no relationships were found between locus of control and behavior recorded with either of the two observation instruments, the Setting Behavior Inventory or the Verbal Behavior Observation Inventory. Yet, intuitively the researchers felt that the instrument did tap stable orientations of the subjects; they seemed to behave as more internal or external in ways that the observations did not detect. Indeed, students' Nowicki-Strickland scores tended to remain the same between the beginnings and the end of the year, when the instrument was readministered. It is possible that most school and other roles can be adapted to by both internals and externals, with internals and externals asking questions with differences that lie beneath the surface of the roles. Equal frequencies, for example, but possibly with different intentions or feelings that the observations were not sensitive to. Perhaps the intensive study of the audiotapes to be conducted by Schwarz will uncover some of this. Another possibility is that the Nowicki-Strickland, like the Rotter instrument, contains factors that relate differently to achievement, collectively, and other orientations (Gurin and Epps, 1975). This needs to be pursued. Meanwhile, it is urged that the research continue to try to keep track of subjects locus of control.

Informal Observations

Informal observations were conducted mainly in the early phase of the study to develop the observation categories. Sometimes, during the formal data collection, however, the observers found it necessary to return to a setting after an observation because of insufficient familiarity with, especially, the materials and procedures used in the setting. This familiarization would obviously result in more valid observations, perhaps less occasions when data functions could be judged, if it were accomplished systematically before each formal observation.

Formal Observations

The Setting Behavior Inventory (SBI) and Verbal Behavior Observation Instrument (VBOI) can be modified and condensed. The forms and their explication used for the present study are reproduced from the First Progress Report in the Appendices of the Final Report. What follows is a commentary on the changes that might be made. The actual re-writing of the instrument(s) must be deferred until the circumstances of their next use become clearer.

First, the evaluation unit has concluded that it must turn to a more conventional event sampling technique, rather than following individual students for lengths of time that result in interdependent observations. The investigators' unfamiliarity with the hospital placements particularly led to the perception of a need in the year past to follow an individual subject through the entire course of a morning in a placement, anticipating that activity might be very different between different phases of the morning. In the main, this turned out not to be the case. If there was a slowdown of activity in some placement settings toward the end of the morning, this would be represented just as well in randomly distributed samples of briefer time spans as in the longer observations. What was not observed was a developmental sequence of time phases that might be violated by briefer observations. Routines tended to recur throughout the duration of a project or placement session, the major exception being when a project group moved from one location to another, say from inside to outside.

Of course, the more experiential settings especially can show continual change in their properties at certain levels of description, as, for example, individuals enter and leave a setting. The proposed strategy reflects some progress with, but not a complete solution of, this problem.

It is recommended that the next observations focus on a given subject for a 15 minute interval, then shift to another subject in another setting for 15 minutes, then to a third for 15 minutes, and so on. Between eight and twelve observations would be collected by a single observer over the course of a day, presuming that the different settings to be observed in were, as at Mount Sinai, in close enough proximity to allow this shifting. The data collected during a given 15 minute interval would be treated as a single observation, i.e., behavior counts would be summarized, judgments as to highest level of functioning would be made just once,etc.

During the first five minutes of an observation the observer would note the relatively fixed features of the setting: date, time, concern, location, things and data sources in use, people in the setting, and interaction format. During the middle five minutes, verbal interaction among the participants would be recorded and characterized. The last five minutes would be used to make summary judgments about the highest levels of things, data, and people functioning observed from the beginning of the observation, together with judgments about the activity levels of the different participants in relation to the subject and how the initiation of activity was shared.

If the observer's initial perceptions of the relatively fixed features were modified after the first five minutes, for example a staff member entered and the interaction format was subsequently perceived to be a supervised task instead of an unsupervised task, changes in the record could be made accordingly. The summary judgments at the end would take this into account, for example in recording staff's being active in relation to the subject for less than the full time. If, however, a whole constellation of setting properties changed, for example in a recitation ending and seatwork beginning, the observation to that point would be scratched and a fresh observation of the same subject would commence. Just where to draw the line for these decisions between changes within a setting and changes of a setting will have to be worked out in the first trials of the revised procedure. The 15 minute observation interval considerably reduces the likelihood of this, compared with the longer intervals used this year.

Some variables from the SBI would be retained in their present form, some would be revised, and some would be eliminated.

Date, time, subject, concern, and location would be kept as they are. Novelty would be better judged by the subjects, and should be eliminated from the observation. The researchers have considered substituting for it some measure of the range or variety of tasks, but that too might be furnished better by the subject; how this is handled in observations of work settings will be investigated in preparation for revising the instrument.

Task movement did not reveal anything not already obvious and is not needed. It is even possible that the recording of things used the setting is redundant with the observation of things functioning, since one always accompanies the other and what things were used did not become a question in the anlysis of this year's data. Staff's, subject's and peer's highest levels of things functioning can be retained as they are, even though the categories of the observation might again be condensed for the analysis as they were this year (see page). Feedback re things must be eliminated, at least in its present form, as reliability could not be obtained for this or any of the feedback variables. It would be highly desirable to revise the feedback variables, but this would require an investigation of its own.

The separate recording of all the data sources operative in a setting has not been useful, but revised categories would make sense. At present, the following are envisioned: *purely expository sources* (written, audiovisual); *sources used to test or practice data operations* (with answers or checks provided, without answers or checks); and *sources coordinated with physical or social functioning* (to be consulted for these functions, to record results of these functions.) These categories would be more likely to identify the data sources that are associated with higher level data functioning and sustained activity. Staff, subject, and peer *data functioning* can be retained as they are, and again condensed as necessary later on *Data feedback*, again, is problematic.

The *ethnicity* of participants was recorded this past year mainly to document the degrees of ethnic integration in different settings, This has not been focused on in the analysis of this year's data, and whether the distinctions were kept, and in what form, would depend on future use of the instrument. The *number of staff and their school or hospital affiliation* (or other organizational affiliation, if used in a different context) would be retained, along with the *number of student peers* and the *number of patients or other clients or addressees* of the staff and student activity. The staff, subject, and peer people functions categories must be modified. One does not want to lose precipitously the link with the *Dictionary of Occupational Titles* categories, however. A slight modification would be to insert the category "collaborating" below "coaching": if tne colloborative activity of a subject or other participant appeared to involve higher level functioning than this reflects, it could be so recorded (as coaching, persuading, or whatever), and the individual's cooperating relationship would still be captured in the interaction format variable. The larger question of the valid sequencing of the people functioning levels needs extensive study.

The categories for recording staff's and subject's activity levels should be retained, but the counting of how many peers were active at each level was time consuming and not sufficiently reliable. Perhaps the fact that more subjects would be focused on in the revised system would reduce the necessity for this count, even though it is not just an evaluative observation but also a description of properties of the setting the subject is in. Related to both this questions and the previous question about collaboration in relation to people functioning is the possibility of introducing a new variable, to be adapted from one developed by Jackson (1977) for his study of children's cooperation with each other in mathematical tasks involving manipulative materials. Jackson included a "division of labor" variable with the following categories:

a. cooperation--division of labor
b. cooperation--taking turns
c. competition
d. subject dominates--partner follows directions
e. subject follows directions--partner dominates
f. subject does all
g. subject passive
h. subject is engaging in marinally related behavior
i. subject and partner orienting to teacher

Some adaptation of this variable might be usefully articulated not only with the variables in question above, but also with the interaction format variable. With this addition the interaction format variable in its present form would continue to be useful, again subject to condensation like that used in the present analysis. Interaction norms is somewhat redundant with the interaction type variable of the VBOI, but it could be sharpened to preserve its special emphasis, the sanctions applying to interaction between peers, rather than simply a description of the interaction network. Initiation would be retained in its present form. Subject's involvement turned out to be practically indistinguishable from activity level, and would be eliminated.

These proposed changes represent an agenda for the initial work of a team that carries on the work of the present evaluation unit. The instrument that would emerge from this has considerable promise for the study of contrasting educational settings, formal and non-formal, academic and experiential, or school and work, as these might variously be identified.

APPENDIX A

INTERVIEWS WITH STUDENTS

The evaluation unit postulated that a student's perception of his environment would have a bearing on the subject's behavior and learning in each setting of the environment. It was decided that the most flexible and valid means of obtaining information about student perception of the environment would be to conduct a structured interview with each student. Therefore, an interview protocol was developed in which the major focus was to investigate how subjects perceived learning to be facilitated in the general education and environmental health classes, the projects and the placements and how students viewed their own behavior in each setting. The interview protocol was based on some of the primary variables in the SBI and VBI; specifically subject perception of his own data, thing and people functions and his own initiating and soliciting behavior in each setting. Subjects were also asked to evaluate the SETH Program's experiential approach to education and to discuss the influence of the program on their formation of career goals. Furthermore, the interview focused on student perception of the entry level skills they would need and SETH's role in helping students acquire entry level skills. The tape-recorded interviews averaged approximately 30 minutes in length and were conducted by members of the evaluation unit at the end of the evaluation period.

Perception of Learning Environments

From the interviews it was apparent that the subjects viewed each class, project and placement individually and did not spontaneously look for superordinate characteristics that distinguished each of the four types of settings from the others. However, in referring to classes, subjects most often spoke about teaching style and subject-matter preference. In referring to projects and placements students usually discussed their duties and the activities performed. The interview questions seemed to require subjects to consider issues not previously considered and it is possible that the focus and wording of the questions caused subjects to consider their settings in a new light.

In asking subjects to characterize what type of learning occurs in each setting, the evaluation unit intentionally left it up to the subject to create his own definition of learning. Later probe questions attempted to pinpoint how the learning experience differed in each setting and which the subjects assessed to be most valuable.

Several subjects emphasized the empirical nature of the hospital placements and expressed the view that a hands on approach is of educational value. A subject who had worked in a patient care setting expressed this by saying "You can learn things in the hospital that you don't learn in school... in class you can say 'my book told me this' but you don't have first hand experience with it. You can see this really happens in a hospital, it's not just in books". Another subject, referring to his laboratory placement said that he had gained a better understanding "by actually doing things".

Subjects also referred to other types of learning that occurred in their placements and which seemed to make the placements positively evaluated learning environments for subjects. Several subjects pointed out that in their placements they were doing real work and making actual contributions to society. Having "responsibilities to patients" seemed to increase self-esteem and motivation. Others found valuable their exposure to people of different ethnic backgrounds. Still other subjects valued the opportunity to use the hospital experience as the basis for a career choice and several felt that the work experience would give them an advantage over other applicants in the job market. Views expressed by subjects about placements were virtually all positive and reflected subject acceptance of an experiential approach to education in a work environment.

Of the 14 subjects interviewed, 4 were placed in video projects and 2 in environmental health projects. Both projects were oriented to the study of the effects of pollutants on the environment. Subjects in the video project specifically described working in small groups and performing a variety of functions including interviewing doctors and taping and editing programs. Subjects in environmental health projects discussed the empirical nature of their study of different pollutants; one described how he remembered information better if he tested it himself. Since the interviews were conducted before the data was anlayzed, the interviewers did not focus on clarifying whether and how students perceived projects as combining features of placements and classrooms. Such information was not spontaneously offered by subjects, although one subject did say that her interactions with people were less stimulating in the project than in the placement because in the project she only interacted with her classmates whom she "saw all the time". Since the 6 subjects in projects were all from Benjamin Franklin High School and had worked in placement in previous years, part of the interview time for these subjects was spent in discussing their past placements rather than their current projects. This may explain, in part, why subjects provided fuller and more detailed descriptions of their placements than of their projects.

General education classes were discussed by subjects in terms of teacher personality and teaching style as well as preference for certain subject matter. Many students placed a high value on the learning that occured in English classes; vocabulary and writing skills were emphasized. A number of subjects said that the math teacher's method of breaking the contents into small units was particularly helpful to them in learning the subject. One subject, discussing social studies, perceived that area as lending itself best to a lecture and discussion format. It was of interest to the evaluation unit that the subjects questioned neither the academic disciplines taught nor the traditional instructional approaches used by many members of the SETH staff in teaching general education classes.

Many students drew contrasts between the general education and the environmental health classes. The environmental health classes were viewed as more activity oriented and less "disciplined" than the general education classes. Students described being given assignments in the environmental health classes in which they were asked to look up answers to written questions using a variety of sources. A number of subjects valued this research experience as preparation for college. Several others described the assignments as "confusing". Some expressed dissatisfaction with the materials (e.g., handouts that were unclearly reproduced and books that could not be taken home). Others said that they were not familiar with the teaching style, which was viewed as more "free and open" than that in the general classes. Some subjects felt they were not being presented the subject matter. As one student said "I was brought up to learn from the teacher".

Interestingly, some of the same subjects who had expressed a positive response when an experiential approach was used in the placement expressed a negative reaction when some of the same methods were used in a classroom setting. The evaluation unit has speculated that one reason for this apparent contradiction is that after years of exposure to traditional education, students have developed expectations of what a classroom environment should be like and view learning in the classroom as defined by certain formal characteristics. While they can accept and even advocate the use of non-formal methods in the placement, such methods violate their expectations of how classroom learning should occur and are therefore viewed by certain students to be inappropriate, confusing and of questionable educational value when applied to the classroom.

Entry Level Skills

Fine and Wiley define job performance in terms of three types of skills: adaptive, functional and specific content. Adaptive skills refer to an individual's comportment in a setting and the ability to adjust to the interpersonal, physical and organizational demands of a setting. Functional skills are those "competencies that enable an individual to relate to things, data and people in a setting".

These skills are often general and transferable from one setting to another. Specific content skills are those that are learned in on-the-job training and are often specific to a setting.

Adaptive Skills

While Fine and Wiley claim that adaptive skills are usually developed in early childhood, they also state that these skills may be reinforced in later years. Several of the students described experiences in SETH which appeared to reinforce their ability to function in a range of job situations. One subject described how, in his environmental project, he learned to accept responsibility for the completion of a task and for supervising others when one of his fellow students did not fulfill the assignment given by the subject. When the task was not completed, the subject was held responsible and seems to have learned a valuable lesson in accountability.

Other subjects described learning how to get along with others in their placements and projects. A student assigned to the x-ray placement described himself as "shy" and as "someone who doesn't like to work with people". However, he found that he enjoyed contact with other people in his placement because he "learned what to do and say to patients". Another subject expressed her relief when she found she could speak up to her supervising nurse after the nurse had unjustly reprimanded her. The placements and projects appear to have given students experiences interacting with supervisors and authority figures in a range of situations, as well as, experience functioning in situations that had real and often important consequences.

Functional Skills

Fine and Wiley discuss functional skills in terms of the worker's orientation to people, data and things at an appropriate level of complexity. Because of the focus of the SBI on people, data and things functioning, it was of particular interest to the evaluation unit to determine how students perceived these functions in the observed settings.

Subjects who worked in patient care settings frequently discussed their experiences with staff and patients. For example, a subject placed in a therapeutic activities setting worked with patients at a continually high complexity level, pursuading them to engage in crafts activities and then teaching them how to use the materials. When asked how she had benefited from the placement experience she said she had learned how to get along with patients and to control her temper. The placement had also enabled her to see how other people in the hospital functioned in their jobs as nurses, doctors, nurses aids and social workers. From working in the placement she said she had learned "how to act and how to relate to people".

Other interactions with people described by subjects included: interviewing hospital staff in the video project, teaching a filing system in the EKG office to new workers and other students, and working cooperatively with doctors and technicians in laboratory placements. Interactions with people in the placements and projects appeared more varied and high power than in the classrooms. In the interviews subjects rarely discussed their interactions with people in the classroom. When they did they made such comments as "teachers have really helped me out". In this respect the interview data reflects the SBI finding that the people functions of subjects in placements and projects were of a higher power than the people functions in classrooms.

Among the data functions described by subjects were the identification of micro-organisms, the computer coding of patient information, and the analysis of video tapes made by students. A subject who worked in an environmental health lab discussed the high level analyses he had to make to determine whether factory workers belonged in high risk categories after exposure to certain pollutants. Interestingly, subjects discussed their data functioning in placements and projects much more than they discussed data functioning in classrooms, perhaps because the classroom data functions were more familiar to both subjects and interviewers. Several subjects indicated that the data functioning skills they had learned in SETH would be transferable to other school and job settings. Subjects seemed to view the ability to function with data as a set of valuable skills which it was appropriate to learn in an educational setting and which would be useful to them in the future.

From the interviews it was apparent that the settings varied in their orientation to the use of manipulative objects and the complexity level of skills needed to operate these objects were referred to most frequently by subjects in laboratory placements and the video project. Subjects in the emergency room and microbiology laboratories discussed their use of microscopes and centrifuges to study blood and urine specimens. Subjects in the video project learned to operate cameras and monitors and to edit tapes. Manipulative objects were also used in some of the hospital placements. For example, subjects placed in the dental clinic discussed their use of instruments in examining patients. While it was difficult to assess the exact complexity level of student functioning from the interviews, the subject descriptions seemed to indicate that thing functioning was high in video projects and certain lab placements. The degree to which subjects perceived things functions learned or enacted in SETH as transferable entry level skills was not as apparent from the interviews as it was in the case of data and people functions which subjects clearly perceived as important school and work related skills.

Specific Content Skills

Specific content skills are defined by Fine and Wiley as the skills one learns in a job which are specific to that particular work situation and which are best learned on -the-job. Subjects interviewed discussed some of the skills they had learned which were specific to the particular classroom, project or placement they described. The student who knew the color code used for files in the EKG office had learned a specific content skill, as had the student who had learned the specific computer code used in the quality assurance office. Among other skills, subjects in the environmental health classes and projects had learned to perform tests for certain pollutants in the air and in water, to measure noise pollution and to recognize lead poisoning. Work related specific content skills learned in the general education classes included the filling out of application forms in English class and the computation of commission percentages in math.

The concept of specific content skills raises some interesting educational questions. The first is the degree to which an academic education should concern itself with the teaching of specific skills and ideas as opposed to more general skills and abilities? Traditionally education has been committed to maximizing transfer and generalization, though this aim is often not made clear to students who may in fact be encouraged to focus on the specific content. A second question raised is how the specific contents taught in career education might differ from the contents of traditional academic education? A third question concerns whether any of the three types of skills, adaptive, functional and specific content, can be learned if there is no opportunity for them to be enacted? The mix of formal and non-formal education provided in SETH appears to enable students to develop and enact a wide range of entry level skills that will serve them in both post-secondary school and work settings.

Coordination of Skills

The evaluation unit, in analyzing the taped interviews and the observations, became particularly interested in how the adaptive, functional and specific content skills were coordinated by students in SETH. Fine and Wiley state that "the degree to which a worker can use his functional skills effectively on a job is dependent on the degree to which his adaptive skills enable him to accept and relate to the specific content skill requirements". Because the appropriate coordination of skills is necessary for effective job performance, the unit was concerned with both the facility with which subjects could coordinate their skills and their awareness of how these skills were interrelated.

The coordination of skills was more apparent from the observation data than from the interview data, since subjects were often unable to articulate the relationships between skills employed in SETH settings. One example of skill coordination, observed by the evaluation unit, occured when a subject in the dental clinic was asked to suction fluids from a patient undergoing oral surgery. During the operation the subject noticed that the anesthetic was wearing off and informed the surgeon of his observation. The surgeon dismissed the student's comments and only administered another injection several minutes later when the patient was in tears. It was apparent to the evaluation unit that the student had used his adaptive skills in not refusing the judgment of his supervisor, orienting to the interpersonal demands of the situation. He understood and accepted his supervisor's specific and ideosyncratic behavior and through this acceptance had been able to continue to perform the functional duties for which he was responsible.

In another example, a subject working in an environmental health laboratory was able to perform at high data and people functioning levels because he had used his adaptive skills to earn the respect of the scientist who supervised him. She, in turn, had taken the time to teach him her distinctive methods for approaching data, enabling the subject to function at a higher level than might have been possible otherwise.

Initiating Behavior

During the interview, subjects were asked to discuss the degree of independence they had to control, initiate and pace their own behavior in each setting. Subjects were also asked to discuss their responses to settings where they had autonomy. For the most part, subjects expressed a strong desire to initiate their own activities. Most thought that having choices and responsibilities was a valuable preparation for the future. "All through life people are going to be telling you what to do and when to do it and you've got to be able to make up your own mind and decide for yourself. That's what college is all about". Several subjects referred to their age and indicated an awareness that they were about to enter adulthood and assume adult responsibilities. For example, a subject given much autonomy in her therapeutic activities placement commented that her supervisor "figured that by the 12th grade you can handle this".

In answering questions on initiation, subjects tended to discuss the placements rather than the classroom settings. This is consistent with the SBI findings which indicate that subjects initiated their activities independently more in placements than in projects or classrooms. Yet, while subjects seemed to value their autonomy in the placements, they did not complain about lack of autonomy in the other settings. For both placements and classrooms, subjects favored settings where the demands were clear and explicit. In placements, where student initiation of activities was high, subjects usually described having a well-defined concept of what was expected of them. When asked if she would like more control of her own activities in her placement, one subject answered "I don't have the experience... I don't want to do it wrong". She went on to say that once she received the assignment and was given some instruction on what to do she wanted the freedom to proceed independently without anyone "standing over" her. Generally subjects seemed to favor settings in which there was a balance between direction and independence.

Soliciting Behavior

Since a major focus of the VBI was on soliciting behavior, the evaluation unit considered it vital to learn how students perceive their own access skills and their use of solicits. Although the VBI data provides a much more fine-grained analysis of when and where soliciting occured, the interviews helped determine the conditions under which subjects asked questions and the environmental cues which governed their behavior. While most subjects said that they would ask a question of the teacher or staff member from whom they wanted information, several subjects expressed the fear of appearing "nosey" or "impolite" if they asked "too many questions", personal questions, or if they asked questions at inappropriate times. The rules of how and when to ask questions seemed more clearly defined for subjects in the classroom than in the work setting. Two of the high reading subjects described their annoyance with fellow students who diverted the teacher's focus and occupied class time with irrelevant questions. Interestingly, both of these subjects expressed sensitivity to the factors involved in determining how and when to ask staff members questions in the placements. One possible explanation for the VBI differences found in soliciting behavior between low and high readers in classrooms and placements may be that the students with low reading levels were more comfortable asking questions in the familiar classroom settings, while they were uncertain about the rules of the less familiar placements. High readers, however, may have had fewer questions to ask in the classroom and may have had more confidence in their own questioning abilities in the placements than low reading subjects.

Career Plans

Most of the subjects interviewed plan to enter careers in health related fields. The subjects appear to be representative of the SETH population in which a majority of the students plan health careers. The jobs which subjects hope to eventually fill include: nurse, x-ray technician, chemist, biologist, lab technician, pediatrician and physical therapist. Most of the subjects said they had entered SETH because of their interest in a health career and many said that the program had helped them channel their career interest into a particular specialty that they had either observed or heard about through the program. For example, the student who wants to become a lab technician became interested in this field after his placement in the emergency room lab. One of the four subjects with plans to become a nurse selected geriatrics as her probable specialty as a result of exposure to geriatric patients in her hospital placement. In certain cases subjects discussed how a placement had helped them decide against pursuing a particular field. One student who entered the program with hopes of becoming a doctor and decided that the years of unpaid study were not to his liking. Another subject, assigned to the dental clinic because of her interest in dental hygiene, found the work of the dental hygienist "monotonous" and now plans to become a pediatrician. Still another subject, who had entered SETH with plans to become a nurse has become interested in a video career as a result of her positive experiences in the video project. The consensus among subjects was that the placements and projects facilitated their career choices by exposing them to career models and to actual work experiences.

Conclusions

Interviews with subjects provided the evaluation unit with student evaluations of their learning environments and with a context in which to interpret observation data. The self-report data provided by the structured interview enriched and often substantiated the observation data.

The evaluation unit found that students were interested in discussing their learning environments and appeared to enjoy the opportunity to consider educational issues which they had not previously considered. One conclusion which can be drawn from the interviews is that educational programs should provide students with more opportunities to discuss their own educational experiences and their perceptions of the educational process.

Another discovery made from the interviews was that students apply different criteria in evaluating classroom settings than they do in evaluating work settings. In the work setting subjects favored an experiential, activity-oriented, non-formal approach to learning. In the classroom subjects preferred a more traditional, teacher-directed, formal approach. The evaluation unit would suggest that in opening a dialogue with students about the educational process, particular attention be drawn to the relationship between formal and non-formal education and the value of each. Through such a dialogue students might become more tolerant of non-traditional approaches, might view their educations in a larger context, and would hopefully become more active participants in their own educations.

APPENDIX B

STUDENTS' PERCEPTIONS OF THEIR SCIENCE CLASSES, PROJECTS, AND PLACEMENTS AS WORK ENVIRONMENTS.

Social ecology in recent years has placed increasing emphasis on the importance of obtaining participants' perceptions of environments one is investigating. In addition to the interviews of the 14 subjects, the SETH evaluation unit administered to about half of the students an adaptation of the Work Environment Scale (WES) developed by Moos and Insel (1974), one of the Social Climate Scales developed in the Social Ecology Laboratory at Stanford University. A Classroom Environment Scale is also included in the Stanford set, but the SETH unit wanted to apply a single scale to the several settings to be compared, and decided that the work scale could be more readily adapted to classrooms than the classroom scale to work settings. The potential of a comparison of students' perceptions of classroom and work, or academic and experiential settings is self-evident. The SETH sample is too limited to draw any general conclusions, but the exploration of this approach has produced provocative data and is worth reporting to stimulate further investigation.

The Work Environment Scale includes the following subscales: involvement, peer cohesion, staff support, autonomy, task orientation, work pressure, clarity, control, innovation, and physical comfort. It was decided that physical comfort, involving lighting, heat, crowding, and attractiveness, was not likely to be a significant variable in the Mount Sinai environment, and so the items pertaining to this subscale were omitted from the adapted form. A few items of special interest from the Classroom Environment Scale were used in their place, but since they did not add up to a subscale, results are not reported for them here.

Two versions of the WES were created, one for the science classrooms and the other for the projects and placements. The classroom version substituted the word "teacher" for "supervisor", and the word "student" for "worker", in items referring to supervisors and/or workers. The project and placement version substituted the word "student" for "worker", but kept the word supervisor, even though the project leaders were officially teachers. Otherwise the two versions were identical with each other and with the truncated (nine subscale) WES.

The WES was administered in an auditorium toward the end of the first semester, to slightly more than half the SETH students. It thus represents the students' perceptions of their environmental science classes and their projects and placements at that time. Of the 90 students, 54 completed an environmental science class form, 23 a form for projects, and 20 a form for placements.

The WES is available in two forms, a long form of 90 items and a short form of 40 items. The latter is not valid for judgments or decisions about individuals, but is valid for obtaining estimates of group perceptions. The 40 item form seemed to be the limit that the students could tolerate, although it would have been desirable to obtain valid scores for the 14 subjects and individuals, and long form scores for all subjects on account of their greater sensitivity to significant differences.

Table X presents a summary of the median scores on each subscale of the adapted WES for the environmental science classes, projects, and placements respectively. It also shows the median scores Moos and Insel report for a sample of workers in 44 work groups representing a considerable vairety of work environments. (The number of 482 workers is an estimate from information provided in the manual.)

TABLE X

Median Scores on Adapted Versions of the Work Environment Scale Short Form

	Science Classess	Projects	Placements	44 Work Groups
1. Involvement	2.0	2.8	2.8	2.8
2. Peer Cohesion	1.9	2.3	2.4	2.7
3. Staff Support	2.6	2.4	3.0	2.9
4. Autonomy	2.0	2.0	2.5	2.7
5. Task Orientation	2.5	2.8	2.9	2.5
6. Work Pressure	2.2	1.9	1.5	1.8
7. Clarity	2.3	2.5	3.1	2.3
8. Control	2.0	2.5	2.5	2.3
9. Innovation	2.4	2.5	2.4	2.4
Respondents	54	23	20	482

Using a test, none of the differences between project and placement scores were significant. Involvement was lower in classes than in both projects and placements, clarity was lower in classes than in placements, and work pressure was higher in classes than in placements. These differences can all be related to observations made by the SETH evaluation unit or by the students themselves in their interviews. Involvement was observed to be substantially lower in classes than in projects and placements. Work pressure might be related to the observation that staff was most active with students in the science classes, mostly in teaching roles which made high demands on students' attention and responding. Finally, in their interviews students frequently commented on the lack of clarity in the science classes, especially the confusion they felt in trying to deal with discovery assignments.

The significance of differences between the various SETH settings and the 44 work groups cannot be calculated because Moos and Insel do not provide standard deviations for individual respondents. Certain patterns in the data are provocative. The involvement reported for the 44 work groups is the same as that the students perceived in their projects and placements. Peer cohesion appears to be highest in the work groups and lowest in the classes. Again, autonomy appears to be highest in the work groups and lowest in the classes. Other differences are not as pronounced as these, and indeed one is struck equally by similarities, for example between the work groups and the classes on task orientation, clarity, and innovation.

The appearances of differences and similarities are tantalizing enough to lead to the research unit's wanting to administer an adaptation of the long form to a larger sample of students in a future study of classes and experiential settings. Simply the feasibility of using an instrument like the WES to tap students' perceptions of their environments, together with a lesson about the volume of data needed, is what has chiefly been learned from this first attempt.

Environment - Person Interaction: Research Background

1. The general model

The SETH research has taken the following formulation from Lewin's field theory as its fundamental point of departure:

> In general terms, behavior (B) is a function (F) of the person (P) and of his environment (E), B = F (P, E). (Lewin, 1946: 239)

A wide variety of studies that Lewin interpreted in stating this formulation, and contemporary studies, many of them conducted by Lewin's protegees and their own students (Barker, 1968; Wicker, 1972), have confirmed the utility of this general framework.

The problem of selecting and keeping track of the many variables that might interplay in B = F (P, E) invites the use of systems theory as a complement to field or ecological theory. Dobbert (1976) has presented an interpretation of systems theory in anthropological research that is particularly germaine to the present investigation. Using his notation, the most simple formulation of the SETH framework is the following:

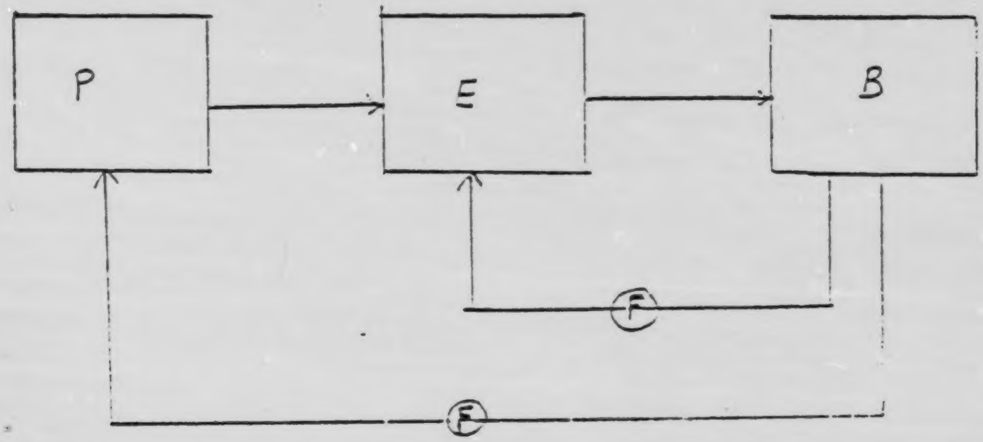

Figure 1.

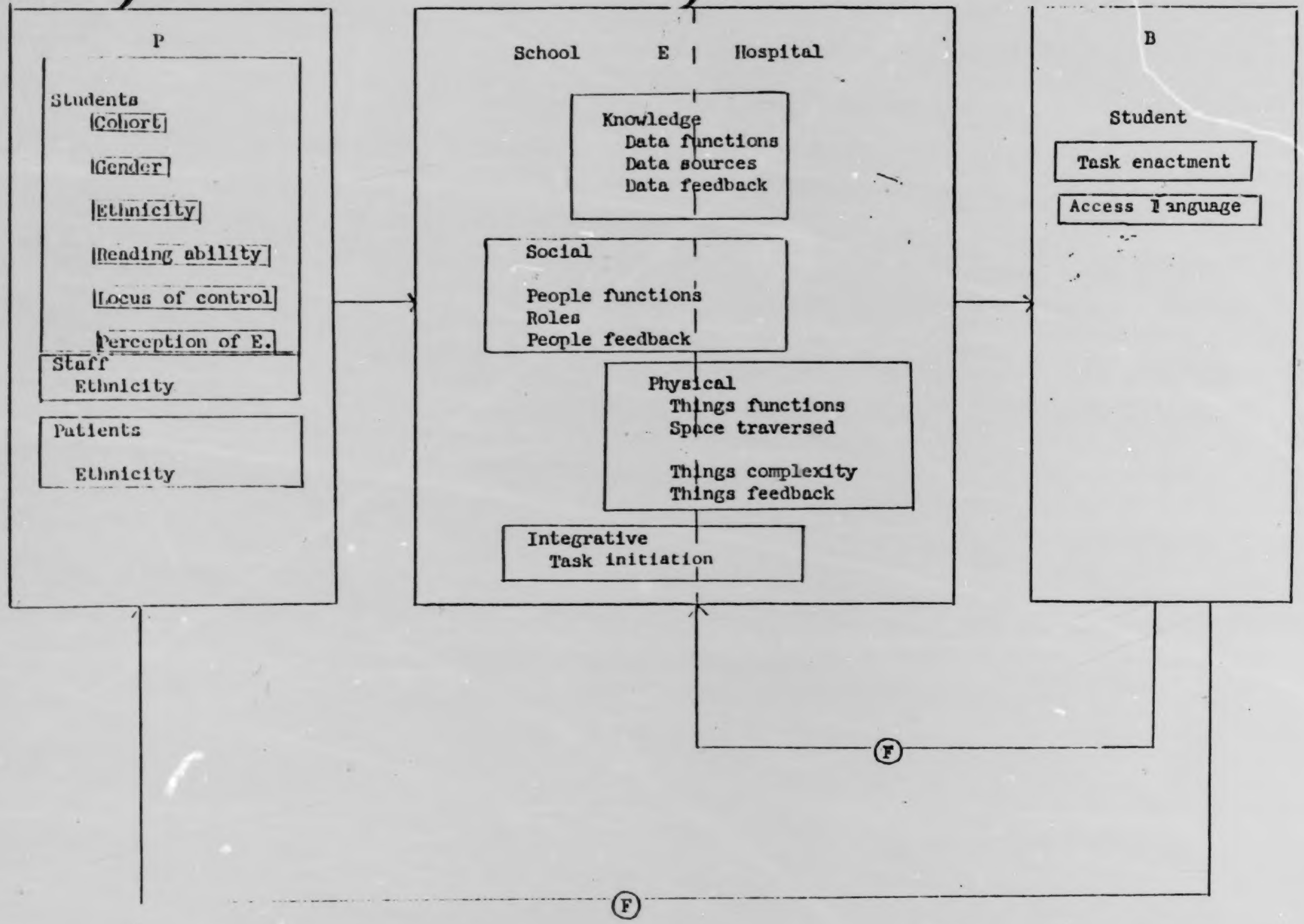
P
Students
Cohort
Gender
Ethnicity
Reading ability
Locus of control
Perception of E.
Staff
Ethnicity
Patients
Ethnicity
School
E
Hospital
Knowledge
Data functions
Data sources
Data feedback
Social
People functions
Roles
People feedback
Physical
Things functions
Space traversed
Things complexity
Things feedback
Integrative
Task initiation
B
Student
Task enactment
Access language
F
F

Figure 2

According to this scheme, persons act within the environment, with resulting behavior that feeds back to change, over time, both the environment and the persons. This formulation would be consistent with Lewin's theory. However, it is possible that observation would not document one or another of the influences hypothesized in this scheme, for example, that changes in the environment over time would not be observed as a function of behavior. Thus the scheme that is eventually used to summarize the SETH findings might differ from the scheme above in one or another respect.

Dobbert's approach recognizes that statistical inference might be used to test some relationships in a model, but that more contextual data might have to be resorted to examine other relationships. The SETH researchers anticipate gathering and analyzing data with both large and small numbers of subjects and/or settings, and will attempt to integrate these different data in the schematization of the findings of the research.

Another feature of Dobbert's approach is a set of rules for distinguishing and schematizing variables within the larger components of a system. Figure 2 displays the basic variables that the SETH research will focus on. Further sections of the research background below provide some clarification of the concepts involved, and the SETH research instruments furnish operational definitions for them. One problem that Figures 1 and 2 do not recognize is the overlap among some of the categories, particularly in the E and B components. As will be explicated below, the categories "knowledge," "social," and "physical" can be applied to any object within a human environment, so that, for example, one might speak of a book as a knowledge, a social, or a physical object. Similarly, task enactment can involve language, the language can include access behavior, etc. The distinctions have been made in order to insure that the research focuses on each aspect of the environmental or behavioral complex in question, but their overlap will not be ignored in the interpretation of the data.

The system model has been drawn to encourage and facilitate the search for causal relationships, both intended and unintended, among the components of the SETH program. In keeping with the ecological approach, however, the emphasis will be first of all descriptive (Bronfenbrenner, 1975). The data is meant to provide feedback to the program as well as to contribute to the development of basic knowledge.

2. Person variables

Only ethnicity will be considered as a person variable of the school and hospital staff and of the patients observed in settings with the students. The purpose of this is to document the patterns of ethnic integration among the participants in the settings, and to see how staff ethnicity affects student language use. That a staff member of the school or hospital is functioning as lecturer, or a supervisor, or in some other role, will be treated as an environmental variable, the presumption being that a given person might be observed in more than one role.

The person variables that SETH has identified as potentially significant discriminators among the students in the program include cohort, gener, ethnicity, reading ability, perception of locus of control, and perception of the educational environment, the latter three at both the beginning and the termination of the academic year.

"Cohort" refers to the high school affiliation of the students in the SETH program. While environmental factors will impinge on each cohort over the course of the year at Mt. Sinai, previous experience in the program suggests that a given cohort enters with group qualities that can be defined as the collective state of the cohort at that time, and these qualities might change or persist over the time observed.

Lee and Gropper (174) have reviewed research that demonstrates the interaction of students' gender with sex roles in different classroom cultures. To the extent that different roles are available in one or another school or hospital setting of the SETH environment, there may be interactions with the students' gender that are manifested in the student behaviors observed in these settings. Similarly, previous research has specified ways in which differenct ethnic identities of students interact with classroom roles to yield varying behavior patterns, for example Philips' (1972) study of the communicative behavior of Indian and non-Indian children in school and out-of-school settings, and Labov's (1972) observations of the behavior of Black children in formal and non-formal situations.

Students' reading ability is the single most crucial component of competence in the conventional academic environment. Whether this will continue to be the case in SETH, or whether students with low reading ability on entry to the program can function effectively in at least some settings of the program, is a major question. The Metropolitan Achievement Test of reading will be used to gauge students' reading ability.

Since Rotter's (1966) original work defining perceived locus of control along a dimension of internality-externality, a great deal of research has demonstrated the importance of this personality construct. Externality has been shown to be associated with students' lower academic achievement (Coleman 1966) and with greater responsiveness to praise in an instructional situation (Lintner and Ducette, 1974). In earlier research, closely related to locus of control, alienation has been shown to be associated with hospital patients' lesser knowledge of the condition and treatment of their health (Seeman and Evans, 1962) and with reformatory inmates' lesser learning of information relevant to their prison career (Seeman, 1963). Of various attempts to create an instrument appropriate for measuring children's perceived locus of control, the most appropriate for SETH's purposes appears to be the Nowicki-Strickland Scale (1976). The items are written at a 5th grade reading level , while the content of the scale, especially a subset of half the items has been oriented to older children. Acceptable reliability and validity have been obtained through a variety of studies including many subjects. Inspection of the items reveals that virtually all are couched in the framework of the personal life of the student, a condition that Gurin et al. (1969) have argued is necessary to discriminate between a Black (and possibly other) individual's perception of control in a more personal sphere and his or her perception of the societal "system" at large. Very few seem to have examined the effect of experience in an institution on changes in perceived locus of control (cf. Bartel, 1971). SETH will attempt to look both for interactions between entry locus of control and behavior in settings, and for changes in locus of control between the beginning and the end of the year of the study.

The main current research approach to students' perceptions of the educational environmental is paper-and-pencil inventories, notably those of Wahlberg and his students (Anderson and Wahlberg, 1974), and those of Moos and the Stanford Social Ecology Laboratory (Moos and Trickett, 1974). The Wahlberg instrument was the first developed, and has been used extensively in a variety of studies, including research that establishes relationships between students' perception of the environment and their achievement, and research that demonstrates correlations between the students' perceptions and judgments of external observers. An advantage of the Stanford work, on the other hand, is that related instruments have also been designed to assess perceptions of the environments of treatment wards and work settings. The major items in the Wahlberg instrument concern cohesiveness, diversity, formality, speed, environment (access to books and equipment), friction, goal direction, favoritism, difficulty, apathy, democracy, cliqueness, satisfaction, disorganization, and competitiveness. The item clusters in the Moos instrument are labeled involvement, affiliation, teacher support, task orientation, competition, order and organization, rule clarity, teacher control, and innovation. The choice facing SETH researchers was whether to use the Wahlberg instrument, with the greater possibilities for relating it to previous research, or to use a Stanford instrument, possibly combining items from the different instruments in the set. The latter course has been taken, combining items from the work and school environment inventories.

Interview techniques have been explored by the SETH researchers during the past year, especially to ascertain students' more immediate perceptions of activity they have been observed in within different settings. De-briefing interviews will be employed in a similar way in the 1976-77 study.

3. Observation of environments

A full-fledged observation of the human environment of education, work, recreation, or any activity, should attend equally to intellectual, social, and physical features of the environment. These distinctions, or categories very much like them--for example, "cognitive," "affective," and "psychomotoric" (Bloom et al., 1956)--are quite common in educational discourse, but they are rarely operationalized. Grannis has defined them in terms of the types of judgments that are required of the participants in a human environment: the intellectual features being those that involve judgments of recognition and truth-falsity, the social features entailing judgments of morality and obligation, and the physical features requiring judgments of bodily and perceptual appropriatness and satisfaction (Grannis, 1971). The intellectual level of the demands and opportunities in an environment, the location of the different participants in a social hierarchy, and the variety of physical objects, spaces, and times that interface with the participants, all are aspects of the total environment that any individual participant must negotiate. As noted before, any phenomenon in the environment can be judged from the standpoint of knowledge, social, or physical criteria. One can ask what a given machine is, whether one is allowed or required to operate it, or how fast one has to move to regulate the machine effectively. It is to insure that the different types of judgment that are likely to be involved in different aspects of an activity are recognized that the observation will attend to elements of the environment which can be presumed to be saliently knowledge, social, or physical for the actors in the environment.

Grannis' theory holds that it is through their orientation to goals or tasks that individuals coordinate their intellectual, social, and physical judgments. What is involved is an individual's looking to self, other, or some combination of self and other, for the criteria by which to regulate the accomplishment of the goal. The category 'Integrative' in the E frame of the general model (figure 2) stands for this aspect of the environment, and is operationalized in terms of the initiation of activity observed at a given time.

Remarkable advances on the study of educational environments were made in a variety of studies during the 1930's and early 1940's. Thomas et al. (1933) observed children's activity to determine the proportions of time spent alone, in interaction with other children, and interacting with materials, and to ascertain the extent to which the children persisted in their chosen tasks under these varying conditions. These same researchers carried out a similar investigation in adult work settings, establishing a precedent for SETH's approach to the settings of the school and the hospital. Van Alstyne (1932), Updegraff and Herbst (1933), and Johnson (1935), all examined the extent and nature of children's interactions with one another as a function of the presence of different types of play materials and equipment. And in a series of studies of "activity" and "non-activity" classrooms, Jersild and his associates conducted highly comprehensive observations in both classroom and excursion settings, attending explicitly to various intellectual and social qualities of the children's activity, and categorizing the concerns of the activities in ways that included physical materials involved, for example, art, crafts, technical skills, and physical training (Jersild et al., 1939; Jersild et al., 1941; Thorndike et al., 1941). However, these studies stopped short of asking specifically what the effects of the presence or absence of manipulative materials etc. might be.

Observation research in education from the mid-1940's until quite recently focused more and more systematically on the interaction among the participants in classroom settings, tending to ignore the physical features of the settings, and, indeed, narrowing increasingly to the interaction between the teacher and the learners, and correspondingly differentiating less among the interactions between the learners themselves (Anderson, 1939, 1943; Withall, 1949; Hughes, Flanders, 1959; 1960; Bellack et al., 1966).

Perhaps this constriction reflected the shift from the more broadly based pedagogy of the Progressive educators to the more teacher centered pedagogy that emerged after the war (Cremin, 1961). It may also have reflected the increasing technical investment that researchers made in interaction analysis per se. Since the late 1950's, however, a new wave of more learner oriented pedagogies has run ahead of this research, most obviously the "discovery" approach of the "new" mathematics, science, and so on, and, later, open education, but also behavior management systems like Individually Prescribed Instruction and Project PLAN. These developments have occasioned new systems of observation that have begun to restore the balance of intellectual, social, and physical features recognized in the educational environment. Lindvall's system for observing IPI classrooms (Lindvall et al, 1967), and Sherman's (1974) approach to analyzing learner behavior in an open science classroom, are notable among those schemes that have been developed to look at specialized types of more learner-oriented classrooms. The more general systems recently developed by Mayer (1973), Grannis (1972), Stallings (1973), and Ross (1975), for observation in the variety of classrooms sponsored by Project Follow Through, all attend to physical as well as social and intellectual features of the classrooms observed.

All of these instruments created for the observation of new programs are intended to identify classroom conditions that are associated with the accomplishment of educational goals. Two points about this are crucial for the SETH research. First, some of the goals are defined in terms of the classroom behaviors themselves, learners' initiating activities, their cooperating with one another, and their verbalizing higher level cognitions, for example. Second, even the research which is principally concerned with discovering the conditions that are associated with subsequent performance on achievement tests recognizes that the labels attached to the classrooms--

"traditional," "open," "behavior analysis," and so on--are not as powerful for the prediction of this achievement as specification of the time that the learners spend under different conditions in the classrooms concerned (Cooley and Lohnes, 1976; Soar and Soar, 1972; Stallings, 1973). For the present research, this implies that certain student behaviors observed might be valued in their own right, in which case the research documents the extent of their occurrence. Continuing the parallel, the research must attempt to identify the environmental conditions that are associated both with these valued behaviors and with valued performances on achievement tests or other personal assessments.

Working within the general thrust of these pedagogical developments, and particularly influenced by Bernstein's (1971) argument that any pedagogical condition can be examined from the standpoint of control, Grannis (1973, 1975; 1976) has observed Follow Through classrooms, and has analyzed related research, from the standpoint of the consequences of different controls of intellectual, social, and physical conditions in the classroom. His research has particularly focused on the control of options, pacing, feedback from materials, and interaction between learners, and has distinguished between control by the teacher, by the learner(s), and by the teacher and learner(s) jointly, for each of these four environmental variables. Grannis has established that consistency among the controls of these conditions is associated with higher on-task behavior by the learners than inconsistency among their controls. As time on task has been shown in other recent research to be a strong predictor of achievement in the task areas attended to (Bloom, 1974), the consistency finding promises to lead to further understanding of the conditions that promote achievement of one kind or another.

The SETH instrument includes the Grannis categories mentioned above, and other control categories that also seem relevant to the investigation. However, the categoreis have all been redefined on the basis of exploratory observations in both school and hospital settings over the past year, in order to adapt them to the different particulars of the settings of this new study.

In addition to the pedagogical developments sketched above, another factor that has contributed to the current environmental broadening of observation in education, and that also influences Grannis's research, has been the growth of ecological psychology since the 1940's, especially during the past 10 years. Lewin, again, has been the prime source. Barker's (1968) concept of the "behavior-milieu synomorph" posits the fittingness of behavior and milieu to each other, and explores their mutual accommodation. Ecological psychology stresses the unintended or unsuspected consequences that can result from environmental arrangements, as well as the intended consequences that nonecological assessment approaches are more likely to focus on. The concept of the "behavior setting" directs the researcher to look for recurrent configurations of physical, social, and intellectual features of an environment with which "standing patterns of behavior" might be associated, not just at the general level of school or hospital or other setting, but within the school, within the hospital, etc. (Barker and Gump , 1964; Gump, 1967). The concept of the "behavior stream" draws attention to the paths that individuals negotiate through different settings, in pursuit of specific tasks that have been set for the individual or that individuals define for themselves (Barker, 1963). The SETH procedure involves observing selected individuals through time in different settings, to capture both the temporal and the spatial dimensions of the patterns of their activity.

A final major source of environmental (and also behavioral) categories for the SETH observation instrument is the work of Fine and Wiley (1971) defining the complexity of all the jobs recognized in the Dictionary of Occupational Titles. Several features of this work lend it to the SETH research. First, Fine and Wiley distinguish between "data", "people," and "thing" components of jobs, and this fits directly into the intellectual-social-physical framework required for the analysis of activities in educational environments. Second, Fine and Wiley discriminate lower and higher levels of complexity of the worker's functioning in each of these three aspects of a given job. The levels have some comparability to the levels of cognitive, affective, and psycho-motoric behavior in Bloom's scheme, but appear to be more reliably applicable to the activities in the variety of school and hospital settings SETH encompasses. Third, the categories invite comparisons of the complexity of tasks in school and hospital settings, not least to formulate hypotheses about the transfer of competencies between school and hospital, or between school and work situations more generally. And fourth, the levels of complexity in each of the three aspects of jobs, "data functions," "people functions," and "thing functions," are manifestly coordinate with the degree of control exercised by the worker over his activity and the definition of the job task itself. Thus this connects with the control orientation of the pedagogical categories, a link that SETH deliberately makes in order to explore relationships between the control of schooling and the control of work.

The connections between the conditions of schooling and the conditions of work--recognizing both school and workplace as involved in education (Cremin, 1976)--may be much stronger than observation has so far recognized. Blauner's (1966) extensive review of research on the conditions of occupational satisfaction established four principal contributions to individual's satisfaction with their work: the status ascribed to jobs by others; control over certain conditions of one's work, especially physical movement, the materials worked with, and the pacing of the work; the opportunity for mutual interaction in work; and colleagueship with others engaged in related work beyond the immediate work setting. The second and third of these factors directly parallel those which appear to be significant for observation in schools, and the first and last suggest other parallels, for example the articulation of school activity with family and peer concerns outside the school. A different type of parallel is equally provocative: industry today is experimenting with a shifting of the control of the conditions Blauner summarizes, from strictly management control more toward what might be called joint management-and-worker control (Upjohn, 1973). Whether the higher education of today's workers is the cause of this, or it is changes in the occupational world that the schools are accommodating to, is difficult to untangle. Nonetheless, the SETH research will ultimately be addressed to questions of this order.

4. Behavior

Environment and behavior are only relatively distinguished from one another, as indeed must be said also of environment and persons. "Standing patterns of behavior" are part of the environment. These include the interpersonal roles staff and students are observed to occupy, and the general characteristics of the tasks in the environment. It is when there is a question of the degree to which an individual is meeting the expectations of a role or a task, or when one wants to attend more microscopically to elements of the behavior that enactment of the role or task involves, that it becomes useful to distinguish between behavior and environment.

Task enactment is the first area in which the SETH observation will focus on students' behavior in different settings. One question asks whether the orientation of a student's activity at a given moment is to the task expected for the student in the setting being observed, or to an alternative task. The proportion of time that an individual is engaged in a task is, as noted before, both a predictor of achievement or development in the domain of the task, and an indicator of the efficiency of the task setting. Another question asks what the observed student's degree of participation is, from passive to active. The task in setting might, for example, call for cooperation between staff and student, or between student and student, but the extent of the observed student's part in the activity could still vary from moment to moment at a more micro-behavioral level.

Fine and Wiley's job functions categories--for things functions, data functions, and people functions--will be used to describe both environment and behavior. The clearest use of them to describe the environment will be SETH's asking what functions a student observes being performed on things, data, or people, by someone else in the setting. SETH will also take note of the functions a student himself or herself enacts, and this can be treated as information both about the environment and about behavior. It is more a case of environment if the subsequent analysis tries to determine what levels of job functions different language behaviors are associated with. Level of functioning becomes more a matter of behavior when the question is what other setting features, for example, presence or absence of material things, induce or constrain students' enactments of things, data, and people functions.

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Environment - Language Behavior Interactions: Research Background

The choice of language as the major behavioral variable in the study is the result of a recognition of the severe nature of the problems bicultural youth have with school and occupational language, the central role language plays in gaining access to mainstream American life and the obligation SETH has to enhance the language skills needed by bicultural youth to gain that access. It is based on the assumptions that effective teaching programs are built on a detailed knowledge of existing student abilities and that the range of any student's language competencies can be known only when variables of context and situation are taken into account in the discovery process. It is a response to the need to know to what degree language is relied on to perform the wide range of tasks that an experience based educational program such as SETH provides, as well as the need to know what kinds of language use are stimulated by the range of SETH learning settings.

Multi-setting language research is in strong reaction to the methodology of the language deficit theorists who dominated the field of pedagogical linguistics in the 1960's. This group, inspired by the early work of Basil Bernstein, posited a direct causal connection between social structure, language use and thought. Aspects of language form, such as pronoun usage, hesitation phenomena, clause structure and adverb frequency, in data collected in artificial situations formed the evidence for generalizations about the inability of these language users to use super-ordinate concepts and, in general, to participate in the 'rational' processes of formal education. (Bernstein, 1975)

The validity of this work has been severely shaken by evidence collected in naturalistic settings according to ethnography of speech principles (Hymes, 1964). There is a growing body of research which shows that linguistic performance systematically varies with elements of setting and situation. Lein (1975) found that migrant children's language output, in the home setting, measured in terms of quantity, structural complexity and rate, approximated that desired (but not produced) at school. Labov (1972) described how changes in an interviewer's personality and technique turned a monosyllabic child into a torrent of conversation and Phillips (1972) showed how changes in the "participant structure" of classrooms affected the quality and amount of Indian children's verbal interaction. The SETH instrument is designed to amplify these findings on the interrelationships of setting variables and language performance.

The focus of this instrument is on "soliciting" behavior, which includes all utterances specifically designed to elicit a response, either verbal or non-verbal, from another individual. The speech acts normally designed to do this are commands, requests and questions. This focus was chosen because of our belief in the significance of this language function to the learning experience in general, our judgment that it is particularly crucial in multi-cultural settings where there is disjunction between the culture of the school and the culture of the student and our findings that the research on soliciting behavior is notable in its failure to consider situational and sociological determinants as well as culture specific variations.

Most of the work on soliciting behavior is on questioning as an epistemic activity; "behavior directed toward and reinforced by the acquisition of knowledge". (Berlyne and Frommer, 1966, p. 178) While respectful of the literature on epistemic questioning, the SETH research takes a broader view and is equally interested in questioning as a social act, as interactive behavior conditioned by variables or social structure and process. We would like to look at questioning and the other speech acts of control as role enactments -- evidence of a willingness to take initiative and shape the course of events by eliciting and constraining feedback from the environment. Informing this perspective is the Bernstein concept (Bernstein, 1975, Chapter 11) paralleled by Freire (1971) that consumption of school culture by culturally different students requires that the school knowledge be "reframed" by the student. We hypothesize that the language functions with the most potential for effecting this reframing are solicits. In these two ways, as reflective of social role and as mediator between cultures, we intend to quantify and describe solicits.

Soliciting is, of course, not the only linguistic control strategy available to participants in a verbal interaction. Others include the control of topic introduction and maintenance, control of the allocation of speaking turns (Sacks, 1967; Goodwin, 1975) and the control of talking time. (Soskin and John (1963), among others, has studied the allocation of talking turns and time among participants and hypothesize that this allocation can be used as an indicator of role relationships. Lein (1975) used the term "symmetry" to describe a similar measure and found that talking time was more equally divided between adults and children at home than at school. SETH research procedures will enable us to derive symmetry measures for the communicative settings at SETH.

1. Research on Questioning

Student questioning has long been accorded a central role in the educative process. In 1942, Fahey reported a study showing that the number of questions asked by pupils bore a positive relationship to intelligence, academic achievement and reading abilities and that teachers estimated questioning to be one of the six criteria most clearly related to ability. (Fahey, p.349) There is experimental evidence that questioning is related to the retention of information (Frase, 1975; Ross and Balzer, 1975) and belief in the educational value of questioning has spawned many "inquiry training" projects which are designed to, either through teacher training (Hunter, 1969) or parent training (Henderson and Garcia, 1973) increase the number and types of questions students ask.

Efforts to identify factors conducive to questioning have concentrated on characteristics of the learner and the material to be learned. Suchman (1964), for example, found three clusters of cognitive attributes that concur with questioning: the ability to handle a lot of data, impulsivity and autonomy. Development studies have sought to relate both form and frequency of questions to certain age groups. (Piaget, 1955; McCarthy, 1930; Hornsby and Mosher, 1966). Low SES has correlated with a lower ate of questioning (Rosenthal and Zimmerman, 1970), a lower "level" of questioning (Martin, 1970) and a slower rate of development of questioning skills (Rosenthal and Zimmerman as quoted in Henderson and Garcia, 1973). Berlyne, (19), in looking for the characteristics of information that stimulate curiosty, found that the familiarity of the topic and the degree of incompatibility or "conceptual conflict" inherent in the topic were the salient variables.

2. *Bellack's Research*

The research on classroom discourse as role enabled behavior is dominated by Bellack's landmark study, *Language in the Classroom*. Since Bellack's basic concept of educational discourse as a language game made up of initiatory and reflexive moves and his operational definition of solicits (one of the two initiatory moves) underly the research methodology proposed here, a summary of his findings on solicits follows.

In the classrooms Bellack observed, teachers were responsible for 86% of all solicits. When pupils did solicit, they did so much more frequently about instructional matters than substantive ones. Their solicits were more apt to call for evaluative responses than were those of teachers which were more apt to call for analytic responses. Pupils tended to use yes-no questions, while teachers required "constructed" replies. When forming questions with interrogatives, teachers relied on *what*, while students used *why* and *how*. All solicits for non-linguistic behavior were done by the teacher as were all solicits for deferred as opposed to immediate action. Teacher solicits were longer, predominated by requests, and included commands, while pupils rarely used commands. Teachers used a variety question constructions, including *elliptical*, *conditional* and, most often, *incomplete* (for example--The capital of Italy is—?). while students tended to use conditional constructions.

While Bellack's system for analysing the functions of classroom discourse is by far the most comprehensive that we have, it is designed to compare teacher and student behavior and not to attend to differences between individuals or between educational environments. Research that directly addresses variations in questioning and/or soliciting as related to such differences is, however, emerging.

3. Research Solicits and Environmental Variables

Mishler (1975) has examined questioning strategies as they vary with power and authority relationships in first grade classrooms and finds that:

> "When adults initiate a conversation with a questions, they retain control over its course by successive questioning, i.e. by chaining; when children ask a question, the adult regains control by responding with a question, i.e. by arching. Children question each other through a more balanced use of chaining and arching that might be thought of as either more egalitarian or more competitive." (p. 99) .

Haupt (1966) looked at the frequency of. single units, (question/answer) as compared to extended questioning units and found that the single units predominated in the teacher structured portions of the day while the extended units did so in the child structured and lunch periods. Johns (1968) found a relationship between cognitive level (based on Bloom's taxonomy) of student questions and the indirectness (based on the Flanders measure) of teacher behavior.

Neujahr (1970) , in an application of the Bellack system to individualized classrooms, found that students performed many more of the initiatory moves in the individualized classrooms than in the lecture-discussion format Bellack observed. Ross, Hildy and Balzer (1975) found that providing answers to children's questions significantly increased the asking of more questions.

Boggs (1972), in observing and recording first grade children in Hawaii for two years, heard only 59 questions. He reports that children asked questions of an adult only when the child was one of a group conversing with the adult, a situation he calls a "collective relationship". Questioning in a dyadic relationship occurred only from child to child. Cole and Scribner (1973) discuss the possibility that non-formal learning situations are less apt to be verbally mediated than formal ones, since meaning is so often intrinsic in the context.

4. Research On Cultural Variation In Solicit Form

Information on how the forms of solicits vary with setting variables or learner characteristics is meagre. We know that for question formation in Black English, inversion is a variable rule, while in Standard English, it is categorical. Thus mature Black English speakers will say:

> So why you didn't go to school?
> What I'm thinking of?
> Why I can't play? (examples from Cazden, 1970)

Boggs found that his Hawaiian first graders used neither inversion nor interrogatives in making questions but relied on intonation to convey their interrogative intent. The exceptional instances where inversion or interrogatives were used occurred in casual conversation rather than in classroom dialogue.

We have no ethnographic data on what is probably a far more potent constraint on questioning strategies used by bicultural students in urban classrooms, that of speech-community specific norms of appropriateness.

Henderson and Swanson (1975) report that, "Asking questions is not promoted as a means of obtaining information in traditional Papago culture—" and Elinor Keenan's sociolinguistic study of Malagasy reveals a very rigid ordering of request forms based on the status relationships of the requester and requestee and nature of the act requested. Though we do have data on other speech routines, whose form and structure are speech-community specific, such as Lein's (1975) account of the joking routine she observed among migrant families in the Boston area, a routine totally misunderstood by the middleclass of the community, we do not have analogous information on rules for soliciting, how they might vary cross-culturally and what kind of interference such variations might produce.

Because of the multi-site nature of the investigation and the multi-cultural composition of the student population, it seems reasonable to expect that this work can develop systematic information on culture specific soliciting behavior and the ways in which this behavior is constrained by setting variables.

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SETH Code for observation of student activity in school and hospital settings*

1-4 Date	5-8 Time	9-10 Subject ID
mo/da	abcd	ab

11-12 Concern

H.S. courses
11 English
12 Environmental Science
13 Gym
14 Mathematics
15 Social Studies

Elective mini-courses
21 Child Development
22 Crafts
23 Family Living
24 Guidance and Careers
25 Health Consumerism
26 Job Skills
27 REading and Advanced English
28 Spelling and Writing
29 Testing Skills (S.A.T.)

35 General Medical
36 Careers Demonstration

Environmental Health Projects
41 Air Pollution
42 Enironmental Projection Agency
43 Environmental Research Labs
44 Video Project

Hospital Placements
51 Ambulatory
52 Animal Research
53 Blood Bank
54 Dental Care
55 EDP (Data Processing)
56 EKG
57 ER (Microscopy)
58 Endoscopy
59 Family Planning Clerical
60 Home Care
61 PAC
62 Pathology
63 Patient Rep Service
64 Prenatal
65 Psychiatry
66 Quality Assessment
67 Respiratory Therapy
68 Therapeutic Activities
69 X Ray
70 Microbiology
71 Emergency Room Lab

Interpersonal
81 Organizational meeting
82 Post conference
83 Guidance
84 Game
85 Lunch social
86 Informal social

Personal
91 Eating alone
92 Resting alone

13-14 Location

11 Classroom, front faci
12 Classroom, circle
13 Classroom, groups
14 Classroom, individual
15 Classroom laboratory

21 Research laboratory
22 Patient ward
23 Treatment office

31 Staff office
32 Clerical office

41 Lunch room
42 Informal subsetting in classroom, hall, etc.

51 External, inside
52 External, outside

---

* Grannis, Schwarz, Schwager, Cummings. The things, data, and people functions categories have been adapted from Sidney A. Fine and Wretha W. Wiley, An Introduction to Functional Job Analysis, W. E. Upjohn Institute [illegible] Employment Research, 1971.

15
Novelty

1 Familiar situation and info
2 Familiar situation, new info
3 New situation, familiar info
4 New situation, new info

16
Task movement

1 Subject stationary
2 Move within room
3 Move between rooms or outside

17-21
Things in activity

17 Reading, writing, drawing materials
18 Simple tools, nonsymbolic mats.
19 Complex machines
20 Live animal
21 Live person

0 No
1 Yes
7 Dead

22-25
Things functions

22 School staff
23 Hospital staff
24 Subject
25 Student peer

0 N.A.
1 Handling
2 Feeding-offbearing
3 Tending
4 Manipulating
5 Operating-controlling
6 Driving-controlling
7 Precision working
8 Setting up

26
Feedback re things

0 N.A.
1 No feedback
2 Confirm, no further info
3 Confirm plus further info
4 Disconfirm, no further info
5 Disconfirm plus further info
6 Confirm and disconfirm, no further info
7 Confirm and disconfirm, plus further info
8 All

27-36
Data in activity

27 Labels
28 Cards, records, forms
29 Written expository
30 Nonprogrammed worksheet or workbook
31 Programmed worksheet or workbook
32 Audiovisual expository
33 Dials, gages
34 Blackboard, display
35 Own writing
36 Communicating person

0 No
1 Yes

37-40
Data functions

37 School staff
38 Hospital staff
39 Subject
40 Student peer

0 N.A.
1 Comparing, retrieving
2 Computing, algorithm
3 Infering, estrapolating
4 Compiling
5 Analyzing
6 Innovating
7 Coordinating
8 Synthesizing

41
Feedback re data

0 N.A.
1 No feedback
2 Confirm, no further info
3 Confirm plus further info
4 Disconfirm, no further info
5 Disconfirm plus further info
6 Confirm and disconfirm, no further info
7 Confirm and disconfirm, plus further info
8 All

42
Black school staff

43
Spanish school staff

44
Other school staff

45
Black hospital staff

46
Spanish hospital staff

47
Other hospital staff

48
Black patients

49
Spanish patients

50
Other patients

0
/
9

51-52
Student peers

00
/
99

53
Peer ethnicity

0 N.A.
1 Black
2 Spanish
3 Black and Spanish
4 Other
5 Black and other
6 Spanish and other
7 All

54-61

People functions

54-55

School staff

56-57

Hospital staff

58-59

Subject

60-61

Student peers

00 N.A.
11 Taking instructions, helping
12 Serving
13 Exchanging information
14 Coaching
15 Persuading
16 Diverting, empathizing
17 Consulting
18 Instructing
19 Treating
20 Supervising
21 Negotiating
22 Mentoring

62

Feedback re people

0 N.A.
1 No feedback
2 Confirm, no further info
3 Confirm plus further info
4 Disconfirm, no further info
5 Disconfirm plus further info
6 Confirm and disconfirm, no further info
7 Confirm and disconfirm, plus further info
8 All

63

School staff activity

64

Hospital staff activity

65

Patient activity

66

Subject activity

0 N.A.
1 Observes passively
2 Observes, takes notes
3 Observes, participates up to 1/3 of time
4 Observes, participates up to 2/3 of time
5 Observes, participates 2/3 or more of time
6 Separate, related activity
7 Transition, waiting
8 Off task

67-74

Peer activity

67 Observes passively
68 Observes, takes notes
69 Observes, participates up to 1/3 of time
70 Observes, participates up to 2/3 of time
71 Observes, participates 2/3 to all of time
72 Separate, related activity
73 Transition, waiting
74 Off task

0
/
9

75-76
Interaction format

00 N.A.
11 Lecture, demonstration
12 Recitation, formal discusion
13 Group meeting
14 Interview, tutorial, counseling
15 Informal discussion
16 Observation of ongoing activity

21 Supervised parallel activity
22 Unsupervised parallel activity
23 Supervised cooperative activity
24 Unsupervised cooperative activity
25 Supervised solo activity
26 Unsupervised solo activity

31 Test

77
Interaction norms for peers with subject

0 N.A.
1 Cannot interact
2 Interact through staff only
3 Interact through peer leader
4 Interact directly, dampened or under overvoicing of staff
5 Interact directly, open

78-79
Initiation

11 Staff
12 Patient
13 Other students
14 Subject

21 Staff with patient
22 Staff with other students
23 Staff with subject

31 Patient with other students
32 Patient with subject

41 Other students with subject

51 Other combinations excluding subject
52 Other combinations including subject

80
Subject's involvement

1 Off task
2 Low involvement
3 Moderate involvement
4 High involvement

The Verbal Behavior Observation Instrument

The VBOI allows for the coding of two types of variables; the actual utterances of the various participants and the verbal event or context within which those utterances are made. It represents the first of two stages of data collection, the second of which entails the transcription and microanalysis of sample segments of the audiotape.

Each coding sheet is divided into three frames, each of which represents five minutes of coding time. The grid at the upper half of each frame requires the observer to notate each utterance as either initiatory or responsive (i or r). An initiatory utterance is one which carries the apparent intention of getting its addressee to respond, either verbally or non-verbally. It is normally in the form of a question, request or imperative, but can also be a declarative. All other utterances are coded responsive. The choice of the letter A, P, G, S, or C indicates whether the addressee is an adult, peer, group, subject or patient. A line drawn from one box to another indicates that two utterances are tied together as in a question-answer sequence. The layout of the grid enables its reader to assess the quantity, addressee distribution and sequencing of interactions within each five-minute sequence.

The named categories below the grid are for the coding of characteristics of the interaction as a whole:

I.U. refers to Initial Utterance, the utterance that initiates each five-minute frame and enables the frames to be located on the audiotape.

Topic is for brief single-word synopses of the subject matter(s) touched on.

Goal refers to the apparent purpose that the participants have in common for the interaction as a whole. The six categories below, do not represent any kind of hierarchy and any given frame many contain more than one goal notation. Except for 5, all of the categories presuppose the existence of a task or goal above and beyond the verbal interaction inself, and the categories are designed to describe the relationship the interaction has to that task.

1- assist or expedite manipulative activity
   a. setting up video equipment
   b. creating a pollution map of New York
2- explain/understand blackboard, worksheet, other written material or videotape
   a. blackboard vocabulary words
   b. spelling test items
   c. a passage or feature of a reading assignment
3- explain/understand theoretical background or ancillary information related to the ongoing activity
   a. why slices turn a certain color when dipped in solution
   b. why x-rays appear a certain way
4- instruct or clarify upcoming activities. The airing of procedures to be followed in the near future
   a. preparing to do the hardware store interview
5- exchange information on issues unrelated to activity at hand
   a. discussion of summer earnings
   b. discussion of who is going with who
   c. discussion of after school plans
6- joking, or play or performing
   a. relating anecdotes, jokes, or performing "routines" such as "The Dozens"

Type is an effort to capture the complexity of the communicative setting in terms of the number of strands that the subject can or might (though not necessarily does) participate in. This category and the who to who category following it, parallel the "participant structure" variable that was so important in Phillips' (1972) research on the speech of Indian children and Boggs' (1972) on Hawaiian children.

1- an umbrella interaction audible to all and no other interaction
2- #1 with a number of subinteractions which do not interfere with #1
3- X number of interactive groups, self-contained and fully occupied with the affairs of their own group, one of which belongs to the subject
4- similar to #3, except the interaction subject is involved in must be dyadic, one to one

5- fluid groupings whose membership changes frequently but whose interactions are not audible to neighboring groups

Who to Who. These categories are designed to capture two dimensions of the speech event, directionality and whether the speaking is of a private or public nature. The large amount of sociolinguistic research on addressee variable and our pilot observations led us to believe that these dimensions would strongly affect both the quantity and distribution of functions of any individual's speech:

1- adult to adult in public
2- adult to collective (as in lecture/recitation format
3- adult to and from individual peer in collective
4- peer to collective
5- peer to and from peer in public
6- adult to and from peer in private
7- peer to and from peer in private

Continuousness is important as a quality as well as a way to get a rough quantitative measurement

0 = silence
1 = sporadic; up to 2/3 of the unit has speech
2 = continuous; more than 2/3 of the unit has speech

% of peer speaking time refers to that portion of the speech of a given frame that is produced by students. It refers to time and not turns and is a way of getting a rough symmetry measure. It is coded with the % figure that represents the coder's estimate.

Relationship to Task refers to the degree to which the talk is germane to the task that has been undertaken by the group the subject is part of:

1 = total
2 = partially related
3 = unrelated

Stylistic Features refers to paralinguistic features such as speed, intonation range, loudness, laughter, and interruption patterns.

Miscellaneous is a place to record all contextual comments or descriptive material apparently not captured by the coding categories.

A sample VBOI follows, as well as an example of the manner in which all of the coding sheets for the pilot period for one subject have been summarized to facilitate analysis.

date

coder student setting participants

S	i
	r
A	i
	r
P	i
	r

154

I.u Topics

Goal: a b c d e f Type: a b c d Who -- Who + How? a b c d e f g

Continuous % peer speaking time Stylistic features

Relationship to job

Miscellaneous

S	i
	r
A	i
	r
P	i
	r

I.u Topics

Goal: a b c d e f Type: a b c d Who -- Who + How? a b c d e f g

Continuous % peer speaking time Stylistic features

Relationship to job

Miscellaneous

S	i
	r
A	i
	r
P	i
	r

I.u Topics

Goal: a b c d e f Type: a b c d Who -- Who + How? a b c d e f g

Continuous % peer speaking time Stylistic features

Relationship to job

Miscellaneous

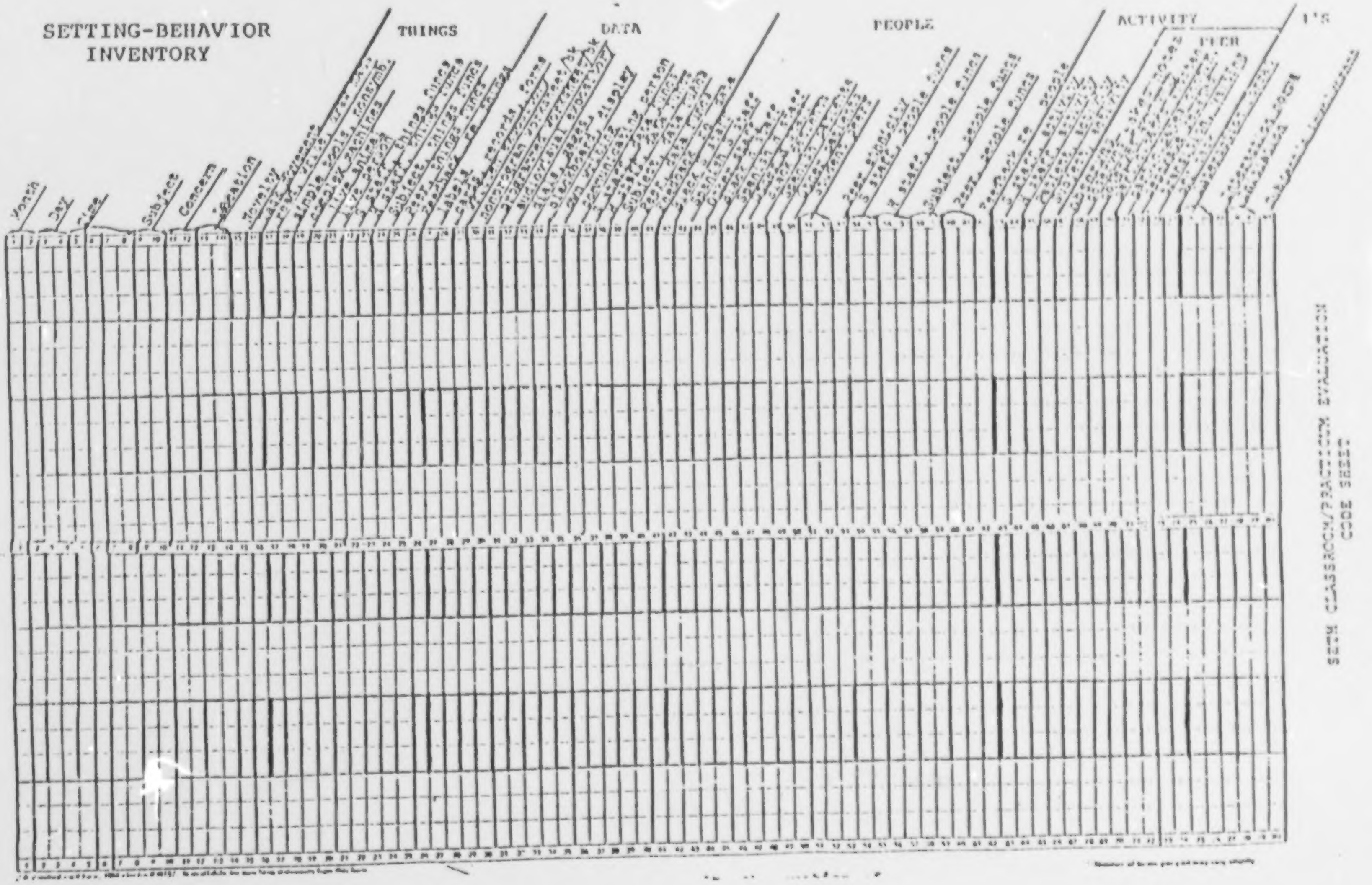
Sub.
1/4/77.
20 frames

	Silent, Sporadic, Continuous 0 1 2	% Peer Partic. 0–10, 11–50, 50+ 1 2 3	Task related / total period none 1 2 3	Subject Solicit 0, 1–3, 4–6, 7+ 0 1 2 3	Subject reciprocate 0, 1–3, 4–6, 7+ 0 1 2 3	Addressee of S's [illegible] P, N, G, C	goal a – f	Type a – e	Who – a – e	# of participants	
9:45-50	1	3	1	1	1	P	a	d	c	3P	no adult
9:50	1	3	1	1	1	P	a	d	c	3P	no adult
9:55	2	1	1	2	1	PGA	a	b	a e b	6	
10:00	2	1	1	0	3	A	c	b	a b e	6	
10:05	1	1	1	2	1	AP	d	b	a b e	6	
11:10	0	[SILENCE]								1	no adult
10:15	0	[SILENCE]								1	no adult
10:20	1	3	1	1	1	P	b	d	c	1	no adult
10:25	1	3	1	1	1	P	b	d	c	1	no adult
10:30	2	1	1	1	0	A	c	a	a b	6	
10:35	2	1	1	1	1	A	cd	b	a b d	5	
10:40	2	2	1	2	0	A	cd	a	a b	6	
10:45	2	2	1	0	0	X	c	a	a b	6	
10:50	2	2	1	2	0	A	c	a	a b	6	
10:55	2	2	1	2	0	G	a c	a	a b b'	6	
11:05	2	3	1	1	0	A	d	b	a b c b'	6	
11:10	2	3	3	3	3	AG	e	b	a b c b'	6	
11:15	2	3	1	3	0	AGP	ad	b	a c	6	
11:25	2	3	2	3	0	GPA	c	a	B'c	6	
11:30	2	3	1	1	1	A	d	a	a b c	6	

Bob 11 H class
1/7/77
8 frames

	silent, sporadic, continuous 0 1 2	% peer partic. 0–10, 11–50, 51– 1 2 3	task related total, partial, none 1 2	subjects 0, 1–3, 4–6, 7+ 0 1 2 3	subject reciprocal 0, 1–3, 4–6, 7+ 0 1 2 3	addressee of S's com. recipient P A G C	goal a – f	type a – e	who → who a – e	# of participants	
11:25	2	1	1	1	0	PG	d	a	ab d	10	
11:30	2	1	1	0	2	A	bcd	a	ab	10	
11:35	2	1	1	0	0	X	c	a	ab	10	
11:40	2	1	1	1	1	PA	c	a	abc	10	
11:45	2	2	1	0	1	A	c	a	abc	10	
11:50	2	3	1	2	1	GPA	c	a	ab c	10	Recommunication private?
11:55	2 /	3	1	3	0	P	c	a	ab b'c	10	
12:00	2	3	1	2	1	GPA	c	b	ab bce	10	
Bob Science 5 frames											
11:20	2	1	1	3	1	A	b	a	ab	12	
11:25	2	1	1	0	3	PA	b	b	ab e	12	
11:30	2	1	1	0	1	A	b	b	ab	12	
11:40	2	1	1	1	0	A	d	b	ad e	12	
11:45	1	1	1	0	0	X	b	b	ad e	12	
Bob Sci. 12/8 [illegible] 7 frames											
11:30	2	2	1	0	0	X	b	a	ab	12	
11:35	2	2	1	0	1	A	b	a	ab	12	
11:40	2	2	1	0	1	A	b	a	ab	12	
11:45	2	2	1	0	0	X	b	a	ab	12	
11:50	2	2	1	2	0	A	bd	a	ab	12	
11:55	2	3	1	2	2	A	d	d	d	4	[illegible]

SETTING-BEHAVIOR INVENTORY


THINGS
DATA
PEOPLE
ACTIVITY
PEER
Month
Day
Time
Subject
Concern
Location
Novelty
simple tools, nonsymb.
complex machines
live animals
Subject, things funcs
Peer, things funcs
Feedback re. things
labels
cards, records, forms
audiovisual
blackboard, display
communicating person
Subject, data funcs
Peer, data funcs
Feedback re. data
Peer ethnicity
S staff, people funcs
M staff, people funcs
Subject, people funcs
Peer, people funcs
Feedback re. people

SETH CLASSROOM/PRACTICUM EVALUATION
CODE SHEET

APPENDIX D

ENVIRONMENTAL HEALTH INVENTORY

The Environmental Health Inventory is designed to be administered in a pre/post-test format to indicate changes in student knowledge, attitudes and career awareness with respect to environmental health. In this regard the inventory items 1, 2, 3. 5 are attitude indicators, items 4, 6, 7, 9, and 10 are knowledge indicators and items 8 and 2 as career awareness indicators.

The Environmental Health Inventory was given to 75 SETH students in early June. The results of student responses to the items are reported in frequency rates and percentages. The items in this summary are clustered by category: knowledge; attitude and career awareness.

Results and Discussion

Knowledge: Student responses to the knowledge categories show that about 90 percent were in the correct range, i.e.,were not incorrect responses. Fifty-two percent of the correct range responses on content were correct responses and forty-eight percent were partially correct in that one or more of the responses should have been combined to answer, all of the above, the correct answer.

Attitude: The attitude inventory sought to reveal the students feeling about their disposition, awareness and sense of motivation to act or alter a condition of unsatisfactory environmental health. Seventy-four percent of the responses indicated that they believed the health problems of those living in the community were related to environmental hazards. One believed that there was no relationship between environmental conditions of the community and the condition of health among community members.

Ninety-eight percent of the student responses indicated that they felt their knowledge about environmental health would help them reduce the health risks in their daily life both now and in the future. Of the ninety-eight percent seventy-two percent indicated their environmental health knowledge would be either a great deal of help to them or would help them to the greatest possible degree to reduce health risks.

Over forty-five percent of the student responses testified to their intent to act to reduce health hazards in the environment by telling friends and neighbors about potential and existing environmental health hazards related to consumer habits, and the conditions of the neighborhood housing and work places.

Twenty-two percent indicated that they would organize a group to help improve identified environmental health conditions that affect your lives.

Career Awareness

The student responses to the area of careers awareness indicate that sixty percent of the students feel that they are very much aware of career possibilities in the environmental health field. Twenty-five percent felt they were aware to 'some degree' career possibilities in the environmental health field.

Eleven percent of the students felt that they were either 'likely' or would 'definitely' pursue a career in environmental health field. Twenty-eight percent of the students felt that they would 'perhaps' seek a career in the environmental health field.

Based on the pilot Environmental Health Inventory, each of the three categories will be expanded with additional questions that will check out the responses identified as the variables salient to objectives of the curriculum.

The overall indications from the student responses on the environmental health inventory are that the curriculum objectives seem to have been effective in their implementation. Both a pre and post-test will in future use of the materials provide greater information in terms of the effect of curriculum over the time frame in which the course is offered; and a control group will be used to more accurately judge the effects of the environmental health curriculum on the treatment group.

CIRCLE THE ANSWERS ON THE ANSWER SHEET. PLEASE DO NOT WRITE IN THIS BOOKLET.

1. To what degree do you think the health problems of the people in your community are due to environmental hazards?

No.	Percent	
5	.06	a) completely---highest degree possible
29	.39	b) a great deal
26	.35	c) to some degree
15	.20	d) not too much---more related to how people treat themselves
--	--	e) not at all---mostly due to bad luck
Total75		

2. To what degree do you think you are now aware of career possibilities in the environmental health field?

No.	Percent	
8	.11	a) highest degree possible
47	.62	b) a great deal
15	.20	c) to some degree
1	.01	d) not too much
4	.05	e) not at all
75		

3. To what degree do you feel that your knowledge about environmental health will help you reduce the health risks in your daily life now and in the future?

No.	Percent	
19	.25	a) highest degree possible
34	.45	b) a great deal
20	.27	c) to some degree
1	.01	d) not too much
1	.01	e) not at all
75		

CIRCLE THE ANSWERS ON THE ANSWER SHEET. PLEASE DO NOT WRITE IN THIS BOOKLET.

4. A person has a job in a factory that produces fabric from cotton fibers. Over a period of 5 to 7 years, he develops 'minor' problems with his respiratory system. The respiratory problems are responsible for his being sick and missing work 10 to 15 days each year. What understanding would you have about the respiratory illness?

1 .01 a) the respiratory problem was probably related to diet.

71 .99 b) the respiratory problem was probably related to the job at the fabric plant

— — c) the worker was probably looking to get time off the job so called in sick

— — d) all of the above

— — e) none of the above

72

5. Which of the following actions are you prepared to take to reduce health hazards in the environment? Choose the one that you are most likely to do in the future.

29 .46 a) tell friends and neighbors about potential and existing environmental health hazards related to their consumer habits, and the conditions of their neighborhood/housing and workplace.

6 .10 b) write a letter to the newspaper

2 .03 c) write to a legislative representative

4 .06 d) leave it to someone who knows more than you to do something

8 .13 e) not do anything because no matter what you do nothing seems to make any difference

14 .22 f) help organize a group to help improve identified environmental health conditions that affect your lives

63

CIRCLE THE ANSWERS ON THE ANSWER SHEET. PLEASE DO NOT WRITE IN THIS BOOKLET.

6. The air has a smell of electric sparks, it's color is brownish-yellow, and the sky is overcast. You have trouble breathing, coughing a lot. Some people feel dizzy and have blurred vision, especially as they walk in heavy traffic areas. You notice on such a day that you have a lot of black particles on your clothes and skin. What judgment would you make about these conditions?

1 .02 a) nothing particularly unusual - that is the way life is

1 .02 b) people with allergies should stay home if they do not feel well

60 ,90 c) the air pollution index is 'unhealthy' and the air is dangerous for people to breathe

2 .04 d) someone had sprayed some unusual substance in the area

— — e) all of the above

1 .02 f) none of the above

67

7. A dry cell battery containing mercury is purchased, used, then thrown out in a garbage can. The garbage is taken to an incinerator and burned. The mercury in the worn out battery is heated by the incinerator's fire, producing mercury vapor. The mercury vapor spills out into the air from the smoke stack of the incinerator. The toxic mercury vapor, carried by the wind, returns to the earth in the rain and snow. The water containing mercury from the rain and snow finds its way to a stream or river. Here it is acted on by bacteria which convert the mercury to methyl mercury. Methyl mercury is soluble and is taken up by the fish in the river. Methyl mercury is not metabolized by the fish, therefore the mercury accumulates in the organs and flesh of the fish.

The fish, with mercury in it, is caught and eaten by some people. The mercury that was in the fish is not metabolized by the human digestive processes

CIRCLE THE ANSWERS ON THE ANSWER SHEET. PLEASE DO NOT WRITE IN THIS BOOKLET.

7. (continued)

and the mercury is deposited in the organs and flesh of the fish eater. sufficient mercury in the human body causes damage to the nervous system.

The situation described above is important because it tells us:

7 .09 a) that everything is connected to everything else
11 .15 b) that everything must go somewhere
28 .37 c) that man must have good understanding of the processes of nature in order to dispose of used materials in a safe way
8 .11 d) that careless acts of disposal may come back to haunt you
2 .03 e) none of the above
19 .25 f) all of the above
75

8. Would you consider training for a career in environmental health such as: environmental engineering, institutional hygiene, animal toxicology?

3 .04 a) definitely
13 .17 b) most likely
21 .28 c) perhaps
20 .27 d) not very likely
18 .24 e) definitely not
75

CIRCLE THE ANSWERS ON THE ANSWER SHEET. PLEASE DO NOT WRITE IN THIS BOOKLET.

9. Diseases caused by environmental hazards are different from diseases like measles, small pox, or a cold, because they:

10 .18 a) are not usually contagious

16 .28 b) usually start many years before they are clearly detected by diagnosis

22 .39 c) are related to life style, including personality, work situation, and living situation

-- --- d) may be related to family histories (genetics)

2 .04 e) none of the above

6 .11 f) all of the above

57

10. Most so called "modern" diseases such as hypertension (high blood pressure), heart disease, cancer, liver disease, and respiratory disease (emphysema and asthma) are believed to be cause by:

15 .25 a) a single agent like diet, bacteria; or a physical factor (asbestos, dust)

18 .31 b) a number of factors that interact in the individual's system

4 .08 c) what is inherited from parents

— — d) old age and the fact that people now live longer, makes them seem to occur more often

16 .26 e) all of the above

6 .10 f) none of the above

59

ENVIRONMENTAL HEALTH CURRICULUM

Mini-Course I - VI

Lloyd R. Sherman, Ed.D.
Coordinator

Mary Jean Young
Maxine Amann
Teacher/Curriculum Writers

Carla Aderente
Kenneth Bloomfield
Marianne Coleman
James DeMetro
Contributors

Raymond Daum, Ed.D.
Videotape Workshop Coordinator

Kenneth Bloomfield
Video Production Assistant

Over the course of the grant period the Secondary Education Through Health - Environmental Health Project developed and implemented a multi-faceted project in environmental health education for high school seniors. The project was designed to be practical and active for both teacher and student. Throughout the project reflected the philosophy and program design of the SETH program; one which incorporates didactic and practical learning to motivate learning and intergrate knowledge.

The Environmental Health Project was superimposed over the on-going SETH program for senior level high school students. Therefore the first and foremost objectives of the project were related to the delivery of educational services to students in the program, which included the curriculum offerings of environmental health in the science subject, practicum in environmental health, either in an apprenticeship placements, a community environmental health project, or an environmental health video production workshop.

Within this context all staff participated in the daily management and guidance activities related in helping students to take the best advantage of the learning environments provided by the SETH program. In this regard the duties of SETH Environmental Health staff was indistinguishable from all other instructional staff. A host of variables involved in meeting the primary needs of the inner city student were met by the SETH Environmental Health staff in a very demanding schedule which included the development aspects of the environmental health component of the curriculum. The SETH Environmental Health curriculum as noted in our progress report included mini-course development (trial testing including materials production); and the practicum (video workshop, student projects and placements).

The Environmental Health curriculum offerings were designed to fulfill two objectives simultaneously, one to provide relevant and useful subject matter for students completing their final year in high school who are also seeking a health career, and secondly, to prepare an environmental health curriculum previously unavailable at the high school level.

Methodology

In concept and design the SETH program approached curriculum development in a 'naturalistic' way. The methodology eschewed 'think tank' planning and development as the major activity in its curriculum development. The SETH curriculum development approach was based on the premis that curriculum is what is actually done in classes and is not what is written in books and teachers guides. Broad stroke planning among teaching staff and/or environmental sciences experts at the Mount Sinai School of Medicine formed the initial kernels for each of the six mini-courses developed in environmental health. The fleshing out of each course occurred through the process dynamics that occurs between teacher and student in the teaching-learning situation.

The primary objectives of evolving curriculum through the context of lesson planning and implementation was to yield more relevant curriculum for students.

The implementation of the SETH Environmental Health component was managed through the process of regular meetings among the director, coordinators and staff of each component. This working process yielded six mini-courses in environmental health, five related videotapes, a newsletter (Environmental Health Bulletin), a Community Environmental Health Directory, Student Placement Reports, and an evaluation study that was designed to assess the level of student functioning in the process learning. The products of each of the sub-components of the program are included with this report.

The Environmental Health Curriculum Construct

At the outset the SETH Environmental Health Component grew out of the need to expand the SETH students perspective of good health practices and career planning to include learning experiences related to health in a community or environmental context. In this regard the SETH Environmental Health program sought to augment the on-going SETH program with an experience-based environmental health component. The SETH Program had established a construct for student thinking about health and disease in terms of diagnosis and treatment. The causes and ultimate prevention of ill health required an environmental health construct.

The SETH Environmental Health Curriculum is guided by the SETH Multiple Balance Construct. The construct of environmental health outlines the major components of a system that influences both the quality of life (Hornback, 1973), and the condition of health (Hinkle, 1977) of people. The construct suggests an ecological relationship among all the factors in the model. Environmental health is understood to be a perspective for looking at two significant attributes of the human condition - health and the quality of life of the people. The construct suggests relationships among interacting variables which have an impact on health and living, i.e., settings (places and things), roles the individual takes in carrying out their life activities, and the control factors - social and political events and activities, all of which are contingent upon the socio-economic situation of the individual or group.

A consequence of the interactions among those variables just noted is an increase or decrease in the risk to the individual condition of health. The risk factor is buffered by the individuals/groups adaptive capabilities. The more adaptable the individual the lower the risk impact on the condition of health.

The natural environment of individuals is depicted as being subjected to over abundances of polluting materials. due to the methods of production and patterns of consumption. In the model pollution destroys or decreases the availability of the natural resources necessary for living. The behavior patterns of people related to the methods of production and consumer habits have impact on health and life quality.

The environmental health construct suggest a curriculum that is grounded both in the natural, physical, social sciences, and urban studies. The six mini-courses span the range of these disciplines. Throughout, the mini-courses engage the student in the process of investigations, problem-solving, and data collection. The mini-courses may be taught in sequence or as individual entities. Each mini-course from a different perspective deals with the central environmental health issues as suggested by the construct.

Environmental Health Mini-Courses I - VI

The mini-courses are presented in a workbook format with teacher notes and extension activities. In many cases the teacher materials and activities need to be fleshed out. This process would best be done through further trial testing the materials in schools. In addition the student resources materials in a number of instances need to be added and/or modified. It is also envisioned that further activities related to elementary statistics and probability would be added, as would additional activities in the area of philosophy and ethics. It is expected that a final edition of the six mini-courses would have additional teacher notes, student resources, and activities, which would be forthcoming after a final field testing.

Environmental Health Practicum

The environmental health practicum was that segment of the program when students were engaged in what is referred to in the evaluation as non-formal learning. The practicum scheduled for two and one half hours two mornings per week, incorporated most directly the SETH program's objective of learning-by-doing. Within the practicum there were four options for student involvement, the placements-apprenticeship experiences with environmental science researchers, and other health professionals; the environmental health video workshop, the environmental health bulletin, and the environmental health community health directory. The evaluation section of this report discusses the learning aspects of these settings.

The placement of students in apprenticeship learning situations in the community, hospital and research laboratories at the Mount Sinai School of Medicine and in research with the Environmental Protection Agency in New York City exposed students to career possibilities, and to the opportunity of learning from role models about an aspect of health care and/or about the ways that research scientists gain knowledge about some environmental health issues. The students tell about their placement experiences in the placement experience writings attached to this report.

The placements were arranged and overseen by the environmental health placement coordinator who set regular assignments for the students while they were in placements. The task setting by the coordinator helped to make the learning environments of the real world an important addition to the learnings of the classroom. Student evaluations of their placement experiences show them to be among the most significant learning experiences students encounter in their schooling. The evaluation in this report also underscores their importance as learning environments. Implementation of environmental education programs may find the addition of an apprenticeship component as a valuable student learning opportunity which augments the school based learning activities.

Environmental Health Video Workshops

Five student produced environmental health videotapes are included as part of this report. The production of these was incorporated into the SETH curriculum to provide students with a valuable learning experience in using the television medium to gain knowledge about the issues related to environmental health as well as how to use the television equipment in the process of producing a visual product.

The five videotapes, Asbestos, the Deadly Dust; Lead Poisoning - The Preventable Disease; Plastics - Problem or Promise; SHHHH!; Pollution - The Solution Is You; are to our knowledge the first single subject environmental health programs ever produced by high school students. The tapes are informative and are a fair representation of an adolescents view of environmental health in the inner city. The tapes are intended to be used with the six mini-courses. Technically the tapes show the earmarks of their neophyte producers. Further editing and dubbing on 3/4" cassettes would enhance the use of the tapes. If they are tedious in places, it is suggested that the teacher use the programs in 10 minute segments. In all cases the teacher should review the tapes and formulate written activities based on the information given them. A teacher/class may get an idea for an investigation into environmental health issue based on what the students on the tape were doing. It is conceivable that a teacher with access to television equipment may set a class/small group project to do a tape modeled after those produced by the SETH students.

SETH student producers screened their videotapes to their peers in the program and to the students from IS99 the School of Communications and Health in Community School District 4. The instructional process associated with the student produced video products suggested that the process was among the most fruitful both in terms of student gain in knowledge about environmental health, improvement in verbal fluency on the subject, and gain in learnings related to production, i.e., doing story boards and using the related television equipment. The use of television as a vehicle for environmental education perhaps has not been explored very much up to now. On the basis of the SETH experience it would appear that the production of television program holds promise of being a valuable approach to environmental health education.

Environmental Health Bulletin and Community Health Directory Projects

Two projects, the SETH Environmental Health Bulletin, and the SETH Community Environmental Guide and Directory, were developed as part of the SETH Environmental Health Curriculum. The products from each of these projects are attached to this report for the readers reference.

The project materials demonstrate the degree of involvement of the students in learning about the environmental health issues and their ability to bring their knowledge and opinions to focus in the two different products. The projects implementation was based on process learning where students and teachers together worked to define objectives, gather information, devise working strategies and meet deadlines. The teamwork itself was edifying for students.

As planned the materials were distributed to the community and in the cases where feedback was given it was very positive. The materials accompanying this report are intended to serve as models of relevant and functional curriculum projects that teachers may adopt in their environmental education programs. Of course, the projects are ultra-relevant to any environmental health education program.

MINI-COURSE TITLES

I - ECOLOGY OF THE URBAN ENVIRONMENT

II - ENVIRONMENTAL HEALTH HAZARDS AND THEIR SOURCES

III - POLLUTION AND HEALTH

IV - CONSUMER HEALTH HAZARDS

V - DISEASES OF THE WORKPLACE

VI - QUALITY OF LIFE

MINI-COURSE I   Ecology of the Urban Environment

Investigates the urban ecosystem where people are the dominate life form. The interactive and ripple effects of events are studied for their effect on health and the quality of life. The course develops an urban ecology perspective, as it defines conditions of health and quality of life.

MINI-COURSE II - Environmental Health Hazards and Their Sources

The course looks at the sites of pollution in the neighborhood or the workplace. Pollution as is related to production methods and political policy making are the focus of the activities. Skills in elementary statistics and graphing are used in the activities.

MINI-COURSE III - Disease-Process and the Environment.

The course is grounded in human biology as it relates to the ranges pollution and stress affect health. Major pollutants are investigated in terms of the organic systems they affect. The economics of health care are analyzed as is the impact of morbidity and mortality on the annual economic costs.

MINI-COURSE IV - Consumer Health Hazards

The hazards to health brough on by consumer behavior is the central focus. Students examine what the materials of consumer objects are made of as well as the quality and quantity of the materials consumed. The hazardous aspects of consumer behavior are emphasized.

MINI-COURSE V - Diseases of the Workplace

The course examines what is being done in the workplace by management, workers (unions) and government, to reduce the risk caused by hazardous materials. It also considers the processess and procedures for establishing standards for chemical and physical pollutants in the workplace and in the neighborhood. The student learns about the process of monitoring and control of hazardous substances.

MINI-COURSE VI - Quality of Life and the Urban Environment

This course considers the main causes of morbidity and mortality among age groups, and seeks to gain insight into the socioeconomic, political, psychological and cultural factors that may be related to the facts. The concept of life style is analyzed as a determinant in the condition of health.

TYPES OF ACTIVITIES

1- Taking information from context - such as: answering questions, making outlines, drawing diagrams from textbooks

(Review of basic information - chemistry, biology, physics, geology, meteorology)

2- Answer specific questions based on readings

(Obtain a knowledge of the subject)

3- Matching

(Apply knowledge)

4- Sort cards

(Make inferences using knowledge)

5- Charts, graphs

(Put knowledge into a comparative order)

6- Case studies

(Draw conclusions from new information)

7- Measurements

(Apply knowledge to laboratory and/or field data collection, including elementary statistics)

8- Library research reports

(Devise and carry out a project to obtain new information)

9- Laboratory exercises

(a- radiation - nucleonics
b- fruit flies - population
c- tobacco seeds - radiation
d- sound level meter
e- gas concentrations)

10- Designing simple environmentally based experimental studies

THE URBAN ECOSYSTEM: A SKETCH

The urban ecosystem is one that is dependent on services and materials brought to it. The urban ecosystem is characterized by the fact that many people live and work on a small area of land. This is accomplished by building tall buildings for living and working.

The urban ecosystem is attractive to people because there are different places to work in the urban setting and there are usually jobs in the many businesses and services there.

The urban ecosystems grew as centers of commerce. The urban ecosystem developed services for the many businesses and people that live and work there. The urban ecosystem has many people from different ethnic backgrounds living in neighborhoods.

The urban ecosystem has fast growing human populations, providing manpower for the businesses and services in the urban setting. Most of the urban environment is man-made. Compared to non-urban setting, the urban ecosystem has little soil available for flora, fauna and human use. Much of the plants and animals in the urban ecosystem are dependent on humans for their existence. Some of the animals are wild and have found habitats and niches in the city parks. Other animals have found habitats and niches in the buildings and subways of the urban places.

All of the man-made environment of the urban setting is shared by all living organisms. The natural resources of water, air and soil are greatly affected by the commercial life in urban areas. The very processes of business, industry and services that make urban areas important places are at the heart of the problem in that they make living in cities less and less desirable for many people.

Many people have found that the quality of life in urban ecosystems is decreasing and many are seeking other places to work and live. The quality of life in the urban ecosystem and in all settings is what people consider to be a life where they have dignity, a means of earning sufficient income to meet their needs, decent housing, a feeling of security, good friends and relatives nearby, and ample time and the opportunity to develop their interests. To the extent that any of these are actually diminished or are perceived to be diminished there is a decrease in the quality of life and in the general condition of health of the individual.

The urban ecosystem has evolved complex relationships among the physical conditions of where people live and work, the political process related to the setting and roles individuals take in their life space. The interactions among all aspects of the life space are significantly influenced by the socioeconomic condition of the individual and their bio-genetic make-up. These interactive factors to a greater extent are driven by the larger and more pervasive forces in the urban ecosystem - the processes of production (methods) and the consequent patterns of consumption by individuals and groups. Productive methods of businesses, industry and public services affect the consumption patterns that develop, in the same way, consumptive patterns influence the methods and products of production - the process is accompanied by pollution and/or side effects that permeate every aspect of the physical, political, socioeconomic spectrum affecting the condition of health of individuals and groups. For example the means of producing public transportation services in a certain setting provide employment for operation of vehicles, maintenance and development workers, law enforcement and revenue officers. Each of these workers labors under conditions of unusually high noise, toxicity of materials in the air from the trains, buses, and cars. They work under stresses created by the political-socio aspects of retaining and advancing in their employment - all related to the city budgets, union, national budgets and the evolution of daily inter-intra group politics. The production of transportation affects neighborhoods and housing either by its absence or presence, or by proximity to housing and neighborhoods which affect convenience to individuals and the development of commerce and industry. Living near a subway or bus stop has many benefits, may effect the rent of apartment and/or land value for housing, offer markets and other shopping stores, establish themselves in and around an area of a transportation stop.

The urban ecosystem is most characterized by the high concentration of human beings who exist in the setting. Population density alone has its affect on the over-all quality of life, as people are continually in close contact with others in every phase of their daily lives. The condition of 'crowded' is the common state of existance in the urban ecosystem. Walking the streets, travelling or public transportation, shopping or participating in recreational activities the individual encounters and is part of the crowd. Even joggers in Central Park have to search for running space on the reservoir track during certain hours of the day.

The urban ecosystem in all of its aspects presents risks to those who inhabit the setting. There are insidious risks that range from being uncomfortable and anxious (about the physical socio-political-psychological aspects of daily life) to actual mental and physical harm brought about by stresses and polluting agents. More overt risks related to deteriorating living conditions, accidents, crime, and social degradation and loss of income interplay with each other in ways that often cause a downward spiral to develop, adversely affecting the condition of health.

Special adaptive attributes are required of those human beings who live in the urban ecosystem. The extent to which the individuals can adapt to the multiple ever changing conditions in the urban ecosystem directly affects their condition of health and their perceived quality of life. To avoid the crowded condition may require intricate planning and coordination for family travel and shopping, using alternate travel routes, shopping out of town and shopping during the off hours, i.e., using all services during less 'convenient' hours in order to increase convenience. Some conditions of the urban ecosystem must be faced head-on where both physical and psychological stamina are required. Many training programs have evolved to help individuals develop adaptive capabilities to cope successfully with the conditions of the urban ecosystem, e.g., transscendental meditation; aggressiveness training; (ask J. McCowan for other examples here.) To the extent that individuals attend to and develop successful adaptive attributes they reduce the risk to both physical and mental health impairment and overall improve their perceived quality of life. Regardless of the individuals ground state (situation in life) developing adaptive capabilities requires education, energy (committment, planning and follow through) and economic resources.

The urban ecosystem is a dynamic system which centers on the interactions of human beings the consequence of which affects the quality of life conditions of health of those that exist in the system.

Decision making at every level in the spectrum of human activity has a ripple effect throughout the system. An individuals choice to live in a particular neighborhood/apartment affects the environment as does the environment affects the individual. The individual decision to own a car affects the environment; use of parking space, causes traffic congestion, supports the automobile industry, adds pollution to the air, ect. A zoning law passed by the city council (may affect the quality of materials used in construction, the allocation of fire, police health services, and other neighborhood services, which in turn affects the resources available, the degree of security, and the overall investment of the individual.

In the urban ecosystem decision-making requires that individuals and groups have the best information available prior to action. The crowded conditions of the urban ecosystem and its overall complexity accentuates its bigness with respect to the individual. The systems bigness requires adaptive responses of individuals that gives them the feeling that they can affect the conditions of their lives. This is expressed through collective actions to bring about improvements in every aspect of the urban ecosystem.

READINGS FOR MINI-COURSE I

1)	*The Economy of Cities*	New York: Random House 1969, Jane Jacobs
2)	*The Tenant*	B. Malamud
3)	*The Closing Circle*	Bantam Books 1971 B. Commoner
4)	*Small is Beautiful*	Schumaker
5)	*Future Shock*	New York: Random House A. Toffler
6)	*Environmental Pollution*	Prentice-Hall 1972 W. Andrews

Articles:

Stress	New York Times Magazine 11/20/77
Semantic Spinach	New York Times Magazine 11/20/77
Measure for Measure, New York Ranks First Among All States	New York Times Magazine 11/20/77

HABITATS AND NICHES

ACTIVITY I-B-I

Where do people live in the urban ecosystem and what are the main factors which determine where they live? Understanding how plants and animals live together may help us to understand this problem.

When we study the picture below we notice that there are many different animals that live in the same area. About how many animals do you count? (Picture Attached)

You would think that the food supply for so many animals living in the same area would not be sufficient for all these animals. However, this is not the case. If you had that many cows or sheep living on the same area of ground they would finish all the food available in a day or so. Give as many reasons as you can think of to explain why these animals can live a long time in the same area. Think of ways that they are different. What is the niche of 4 different animals or plants in the picture?

Describe four different habitats that you see in the picture. To the best of your ability tell about their temperature, humidity, the type of food available, and the way it is used by an organism.

What special way is each of the organisms adapted to its habitat and niche. One way to think about this problem is to imagine the organism in a completely unusual environment - for example, a seagull living in a desert, or a cactus growing in a rain forest.

URBAN HABITATS AND NICHES

ACTIVITY I-B-3

Human beings are the main organisms living in the urban ecosystem. They occupy many different niches (ways they carry out their lives). For the most part those who live in the urban ecosystem occupy similar habitats (some type of apartment), but each dwelling has its distinctive style.

Here are some pictures of different urban habitats.

1) Write a paragraph describing the different roles (both as a worker and as a community member) of people who occupy these habitats.

   Settings:

   a) Park Avenue b) Brownstone c) Condominium

2) For each of the habitats explain what kind of adaptations the dwellers must develop to live a satisfying life.

3) List 5 to 7 factors you believe to be most important influencing the individuals to select the housing.

4) Make a list of the most common stresses faced by those in each setting.

5) How do you imagine each deals with the stresses (adaptations)?

6) What disuse or problems do you see that may result from the habitat condition?

7) Read through your newspaper for 1 week and take out the articles that show the result of stress from living conditions.

8) From one of the articles investigate the story through letter and phone - to find out what the issues were that lead to the situation reported.

II ENVIRONMENTAL POLLUTION

ACTIVITY II-A-I

A. Where it comes from

I. Production Methods

Pollution is a fact of life in modern times. Man with the invention of technology has been able to increase the rate of production and consumption of things in the course of which many by-products are also produced. In an earlier time the products and by-products of man's existence were consumed at a slower rate. In all cases nature was an ally with man as a consumer. Nature's role in this respect has not changed - only its ability to process the increased materials left to it has made it appear less efficient and less willing.

Pollution is a function of a two way street - one - what methods are used in production of things (if your industry's product is a fire retardant material prepared from aspestos - what do you do with the toxic and/or dangerous materials that go into the air and water as you produce the retardant - from getting the raw materials from the earth to their ultimate market and to the consumer? The other way related to the demand people and industry make for things to be consumed. Americans in general are said to be overfed; overinsured, overdressed. Yet more and more people continue to spend greater and greater amounts of money, eating, getting insured and dressing in the most up-to-date fashion of the day.

Here are some facts: (see attached pages)

Based on the information above,how would you answer the following questions?

1) What would you say are the four main industries in the United States?

2) What percent of the total U.S. pollution is caused by each industry you identified in the previous question?

3) The four industries that you have identified are major contributors to the great amount of pollution in our environments. Use the table below to describe how the methods of productions in the various industries cause pollution in the urban ecosystem; identify the main polluting agents associated with the production; identify those most affected by the polluting agents.

4) Use a separate piece of paper for each industry identified and beginning with a raw product make a diagram to show the polluting agents that are associated with the product right up to the actual marketing of the product. For example make an investigation of the polluting agents associated with the production of eggs. Begin with a chicken farm.

2. Consumer Patterns

ACTIVITY II-A-2

As we indicated earlier pollution is the result of a process that includes both the methods of production and consumer patterns. Consumer patterns are basically the purchasing habits of people in the community. The purchasing habits and purchasing potential of people are what keep the industries producing. You can get a good idea of how this works by imagining what would happen if people stopped buying a particular product. (Read Production-Consumption Cycle.)

The urban ecosystem has, as we have indicated, the high concentration of people; and it follows therefore, that these urban areas must have a great potential for consuming goods and services.

1) Select a product or service and describe the impact on the industry and related industries if people in the urban centers stopped spending their money for the product.

2) People in different age groups and different socioeconomic groups have different consuming patterns. Generally those with more money spend more money. Usually as one gets older the amount of income that they have increases to a point between 55 - 60 when the individuals income begins to decline.

   1. Primary expenditures are those which go towards the maintenance of life - food, shelter, clothing and educational needs.

   2. Secondary expenditures are those which go towards the embellishment or development of primary expenditures.

   3. Tertiary expenditures are those which go towards investments and indulgences.

PRODUCTION - CONSUMPTION CYCLE

The Model

The production-consumption model is composed of process, decision, and feedback components. Significantly, pollution results from every process along the flow. The first process the collection of raw materials needed to make the product, encompasses the excavation of mineral and chemical substances the cutting and removal of lumber, the commercial catching o fish, and other actions. Pollution from excavation includes such things as acid mine drainage, slag piles as a resultant solid waste, and pollution resulting from the operation of machinery and equipment, including pollution from the generat of electricity as well as from the operation of internal combustion engines. Pollution from harvesting fish includes oil-spill discharges from engine operations and solid waste discharges from boat operations.

The next process in the flow of goods to the consumer involves interindustry flows of materials which include the manufacturing of equipment, the construction of buildings and other structures, the delivery of agricultural products, the provision of business services, and the manufacture of intermediary products prior to the inception of production for final consumer demand. Pollution from the interindustry segment is characterized by typical air, water, and land pollutants from manufacturing, commerce, and construction, as well as agricultural pollution such as suspended and dissolved solids and pesticides and herbicides.

The next process is final production for the consumer. This process is defined as including only those activities and processes which result directly in goods and services flowing to a final consumer; interindustry flows are excluded. It includes pollution from the final production of goods as well as from final delivery services, such as transportation and construction of buildings for retail activities. The resulting pollutants include dissolved and suspended solids, organic compounds, carbon monoxide, and solid wastes.

The final segment of the flow includes the usage and disposal of goods and services by the consumer, and it is the first process in which pollution is directly attributable to the consumer. Usage pollution includes pollution from the use of residential water and land, domestic electricity, pesticides and fertilizer, automobiles and air conditioning. Usage pollution depends essentially on these factors: the frequency, mode, and completeness of use; extent or utility of product usage; and the product's quality or efficiency. Disposal pollution is the more obvious solid-waste generation. Product discarding includes, for example, auto, stove, and refrigerator hulks and other used consumer durables.

The second portion of the model is the decision component. The decision components of the flow divide into the two categories of production and consumption. Production decisions encompass (a) raw material decisions, (b) interindustry production decisions, and (c) final product decisions. Consumption decisions are (a) purchase-and-usage decision, and (b) disposal decision. Obviously little or no direct pollution is generated by these various decision components. However, these decisions are obviously just as vital in that they determine the type and amount of pollution that will be produced by and result from each of the processes. So, any attempt to solve the problems of pollution must be aimed at these decision points because these decisions may be regarded as the causes of pollution.

Significantly, the production-consumption model shows a shared responsibility for the resultant pollution. The raw material decision to strip mine coal shares the burden for pollution with the interindustry production decision to process and use electricity, among other things, with the decision of final product (i.e., delivery to the consumer and carbon monoxide pollution); as well as with the consumption decisions of the consumer, who burns the coal and creates particulate pollution and otherwise adds to the smog condition. The consumer decision to purchase ever-newer automobiles, works backward to the interindustry decision to produce steel, and earlier, to strip mine coal.

The third portion of the model is the feedback component. The feedback components consist of the (a) demand and (b) recycling feedback loops. Of these, demand is the more important feedback component. Consumer demand traditionally has been viewed in terms of the effects of purchase decisions only on the final product decisions. The model indicates quite clearly that demand feedback plays a greatly expanded role. Not only does consumer demand influence all the production decisions, but the production chain of raw material-interindustry-final product shows an interrelated dependency which explains that any given production decision also influences those production decisions that preceded it. The recital, and subsequent assessment, of responsibility in the coal-steel-auto example is based on the interactions of this demand-feedback loop. From consumer on back, all can be seen to share responsibility for the total problem of pollution.

Recycling, as the second feedback component, is the reclamation of raw material or intermediary product for productive usage once more. The solid waste which results after usage of the consumer item is a function of the type, frequency, and completeness of the usage method, as well as the quality of the product. Various wastes can be differentially reintegrated into the industrial system depending on the original quality and upkeep of the product, the various types of components (i.e., metals, woods, plastics, and other synthetics) used in combination to make the product, and differential technologies that are applied to the recycling process. An assessment of recycling potentialities would only partially include the ease (and cost) of recycling products. In addition, an emphasis on product quality would extend product life and thus economize on the energy power and other resources otherwise necessary to reclaim the recycled product to usable form.

In terms of application of the model, demand for goods and services begins with the consumer. His demand feeds back into the chain process and creates the other demands for intermediate goods and services and raw materials. And, to the extent that the purpose of production is to satisfy demand, demand stands unmasked as the effective cause of pollution. However, even through the model places the greatest emphasis on consumer demand as the effective causal agent of pollution, it reaffirms industry's and its accompany technology's responsibility in the creation of new consumer items or new forms of consumer services. Admittedly, the model does not attempt to quantify in a specific manner the relative importance of each of these factors. However, it does more than nominal importance on the role of the consumer and his independent decision-making process.

Consumer demand is exercised in two dimensions: (a) the consumer originates demands to fulfill basic needs (food, shelter, clothing) in conventional forms, and original consumer needs stimulate production of new items to fill current needs in a better way; (b) as a result, convenience, price, and novelty, as engineered by new technologies and industries, tend to enlarge consumer markets and modify consumer demand through advertising. This new production and technology expands present consumer markets with lower prices and greater convenience, while advertising brings new products to the attention of the consuming public and helps to initiate other needs which it can supply. In a way, it creates and modifies consumer demand, and thus it ever sustains the repetitive flow of goods and services in the economy.

The question of who indeed is to blame for pollution and who is responsible for the environment is hotly debated. Arguments are based on the nature of biological systems, on the role of industry and economics in the society, on the morality of interference with individual freedom, and so on. Depending on the perspective, responsibility seems to shift from overpopulation, to industrial organization, to partialistic technology, to inefficient or nonexistent common property resource management.

This model, however, contributes a wider perspective and recognizes that responsibility for pollution and environmental malfunctions rests with decision-makers at all levels. This model, by centering on the entire production-consumption cycle, is able to focus attention on all the relevant factors contributing to the pollution. The industrial decisions to use particular production methods and materials, the effective control mechanisms for common property resource use, the increasing number of consumers, their mounting affluence levels (a function of rising incomes and assets), and their resultant mounting product demands can each be evaluated as to their influence on total pollution.

An example of a consumer product illustrates the model in use. Paper lunch bags versus steel lunchboxes serves as an illustration of this cycle of demand, production, and use. Assume, for the sake of simplicity, that consumers demand lunch containers, and that two kinds of lunch containers exist, paper bags and steel lunchboxes. This consumer product demand for lunch containers places decision demands on the final producers who must decide which type of container, paper or metal, will be produced. On the basis of marketing information the final producers decide to produce some appropriate mix of the two products. The final producers then place demands on the interindustry producers for equipment and machinery needed to manufacture the paper and steel which will go into them. These demands, in turn, place demands on the raw material producers and extractors for the wood and iron ore needed. Differential pollution is thus produced at each of the production processes, depending on the material.

After the consumer exercises his perogative of product choice, he then uses his lunch container differentially, perhaps only once or a limited number of times in the case of the paper bag but repeatedly in the case of the metal lunchbox. Finally, the differential matter of disposal, either through recycling or just plain throwing the container away, determines whether the demand for another lunch container does or does not reoccur. Advertising may affect or change consumer choice. The model shows that the flow of goods and services from raw materials to final disposal is not linear and static, but instead it is circular and dynamic and constantly adjusts itself through the mechanism of the various feedback loops.

For the different age groups indicated suggest what percent of their income and/or allowances go towards the expenditures in the three categories above.

	Income								
Age Group	$5,000-15,000			$15,000-50,000			$50,000-500,000		
	1	2	3	1	2	3	1	2	3
10 - 15									
15 - 25									
25 - 50									
50 - 70									

Here are some facts: (Read Attached.)

1) In what way does the patterns of consumers influence effect pollution?

2) What age group is responsible for supporting the greatest amount of pollution?

3) What age group has the most favorable impact on the environment?

4) Why do you think this (No.2) age group spends its money the way it does? Write a 3 page essay on this. Use whatever documentation you can to support your argument. Check mean increases in the Data Source Book or Almanac. Your teacher will have other resource materials for you.

5) Do poor and rich spend their money in similar ways? Explain.

2.1 Study the advertisement taken from Playboy magazine. Explain why the life style of the subject in the ad is a major contributing factor in the deteriorating of the environment.

2.2 In what ways does advertising in the media affect consumer patterns? Study the relationship between effective advertising and sales. (Automobiles, Cosmetics.)

The interest today's young men have in the quality of life directly affects the quality of the products you're trying to sell them.

STEPHEN LEFLER, PRESIDENT, DESIGN RESEARCH, INC.

Remember quality? That state of being we took for granted before loose knobs, puckered seams, cracked plastic and service with a frown became a way of life?

Well, it's on its way back.

And it's coming back strong. A ground swell being fed and churned by the most active, vital segment of our population today.

The maturing male adult of the 70's.

Young men like Stephen Lefler, president, at 27, of Design Research, Inc.

Steve Lefler didn't go to work for Design Research just because they happened to need a president. Sure, the economic opportunity was there for him, but D/R is a business that has made a major commitment to the urban environment. And that suits Steve Lefler just fine.

Just as that kind of approach to life suits most of the young men of this generation.

As a kid, that young man dropped out, saying, "I want none of it."

Today, he's elbowing his way in, saying, "I want it. All of it that's good. And what isn't good, I want to help make better. In all aspects of my life."

SOME ASPECTS OF HIS LIFE.

We'll let him tell you some of the things he's been telling us.

"Him" being the under-35 young man, a market with a social consciousness as well as a $241 billion annual income.

A market of young men not at all willing to watch life, but rather, participating in it, collecting life's experiences.

"I buy according to how I live, and that's not necessarily according to what I can afford."

"Sure I get bored. About six seconds every six months."

"If I can help a little kid enjoy life more, I enjoy life more."

"No, I'm not going to keep using that product if it's screwing up the environment. I'll find something else."

"I'm very price conscious. I stay away from cheap."

THERE'S A MESSAGE IN THERE SOMEWHERE.

To us, the message is clear.

It says that lifestyle and enrichment are the criteria, not price or the neighbors.

It says that $1000 isn't too much, but $100 may be.

That quality is not only something they want, but something they make. In life and in salary. To repeat, their collective annual income is already $241 billion. And growing.

That quality includes "serious" things. As a group, they already own $27 billion in securities and $64 billion in life insurance. Last year alone they spent $16 billion on new cars. And $2.2 billion on new clothes.

THERE'S A SALE IN THERE SOMEWHERE.

This is a vital, exciting, spending group of young men.

They devour our magazine like a catalog. 13,655,000 men every month.

Everything they tell us, everything they do, indicates they may well be the most vibrant group of prospects American business has been blessed with since the post-World War II boom.

And you can reach more of this market in PLAYBOY than in any other men's magazine, newsweekly or sportsweekly.

In fact, in many ways, we are the market.

The Playboy reader. His lust is for life.

Soc. Envirn.
EPA-600/5-73-010

SECTION V
POLLUTION DATA

The data on pollution by each of the product categories was obtained for twelve pollutants listed below, and shown in Tables 1 - 3.

WATER	AIR	SOLID WASTE
Biological Oxygen Demand	Particulates	Solid Waste
Suspended Solids	Nitrous Oxides	
Dissolved Solids	Carbon Monoxide	
Phosphate Compounds	Hydrocarbons	
Nitrogen	Sulfur Oxides	

For each of the above pollutant types, the percent of pollution contributed by each of the 10 highest polluting items, and the percent of aggregate consumption expenditures for that item was calculated. Figures for aggregate consumption expenditures were obtained by multiplying average median family incomes by the total number of families for the U.S.

The percent of total pollution figures represents the sum of all pollution which occurs in production of that item until it reaches the consumer. Referring back to the model the pollution index for each item comprises all pollution caused in the extraction of the raw materials, the pollution from all interindustry production of goods and services, and the pollution from final production of each consumer item.

The most important characteristic common to these tables are the two concentration patterns: while these top 10 categories represent 30 to 55% of all consumption expenditures they represent 65 to 95% of all pollution in each category. This implies that efforts to combat pollution can and probably should be concentrated on those few consumer commodities that result in the greatest pollution. In general, agricultural products are the preponderant source of water pollution; utilities, housing, and automobile products are the major contributors to air pollution, and these two together produce the bulk (80%) of the solid waste pollution. (Utilities, housing, and automobiles primarily contribute inorganic solid waste; agricultural products contribute primarily organic solid waste).

Perhaps most notable is the frequency with which certain categories seem to reappear at the top of each pollutant list. These categories, which comprise a list of "top pollutant" items, will be further examined in the next section.

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LID WASTE

Solid Waste

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WATER POLLUTANTS [illegible]

	Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
	Biological Oxygen Demand (BOD-54,228 million lbs.)		
(10)	*Meat, Poultry and Eggs	42.6	5.4
(9)	Dairy Products	11.4	2.5
(8)	Apparel	5.4	5.7
(7)	Toiletry Items	4.7	2.7
(6)	Laundry and Cleaning Supplies	3.4	2.0
(5)	Drugs and Medical Equipment	3.3	1.3
(4)	Cereals and Bakery	2.9	2.2
(3)	Fruits and Vegetables	2.6	2.5
(2)	Autos, Parts, and Repair	2.5	8.9
(1)	Sugar and Confections	2.3	.5
		81.0%	33.7%
	Suspended Solids (932,282 million lbs.)		
(10)	Meat, Poultry and Eggs	68.5	5.4
(9)	Dairy Products	16.3	2.5
(8)	Fruits and Vegetables	2.4	2.5
(7)	Cereals and Bakery	2.1	2.2
(6)	Household Utilities	1.7	3.9
(5)	Tobacco	1.2	1.2
(4)	Shelter and Other Realty	.9	11.4
(3)	Apparel	.9	5.7
(2)	Autos, Parts, and Repair	.8	8.9
(1)	Sugar and Confections	.6	.5
		95.4%	41.7%
	Dissolved Solids (84,179 million lbs.)		
(10)	Toiletry Items	15.8	2.7
(9)	Laundry and Cleaning Supplies	11.4	2.0
(8)	Drugs and Medical Equipment	10.8	1.3
(7)	Apparel	10.3	5.7
(6)	Meat, Poultry and Eggs	5.1	5.4
(5)	Autos, Parts, and Repair	5.1	8.9
(4)	Household Paper Supplies	3.7	.3
(3)	Dairy Products	2.7	2.5
(2)	Medical Services	2.6	5.9
(1)	Insurance	2.6	10.4
		70.1%	45.1%

*Pollution index used to derive aggregate rank scores is discussed in Section 4.0.

WATER POLLUTANTS

phate Compounds (8,751 million lbs.)		
Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
ltry and Eggs	73.6	5.4
ucts	16.9	2.5
Vegetables	2.1	2.5
and Bakery	1.3	2.2
Services	.9	5.9
	.8	5.7
	.5	1.2
d Oils	.5	.5
nce	.5	10.4
Parts, and Repair	.3	8.9
	97.4%	45.2%

Waste Water (66,344 billion gallons)		
Poultry and Eggs	30.1	5.4
and Vegetables	20.5	2.5
Products	10.4	2.5
s and Bakery	7.5	2.2
nd Oils	5.4	.5
el	5.3	5.7
o	4.9	1.2
and Confections	1.7	.5
Parts, and Repair	1.3	8.9
lic Beverages	1.1	1.2
	88.2%	30.6%

Nitrogen (24,436 million lbs.)		
Poultry and Eggs	72.9	5.4
Products	16.8	2.5
and Vegetables	2.4	2.5
s and Bakery	1.4	2.2
l Services	.9	5.9
el	.8	5.7
o	.7	1.2
d Oils	.6	.5
nce	.5	10.4
Parts, and Repair	.3	8.9
	97.3%	45.2%

tion index used to derive aggregate rank scores is dis-

AIR POLLUTANTS (1970)

Particulates (28,401 million lbs.)		
Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
(10)*Household Utilities	17.8	3.9
(9) Autos, Parts, and Repair	10.6	8.9
(8) Meat, Poultry and Eggs	7.0	5.4
(7) Apparel	5.6	5.7
(6) Toiletry Items	4.3	2.7
(5) Dairy Products	3.9	2.5
(4) Shelter and Other Realty	3.8	11.4
(3) Insurance	3.7	10.4
(2) Cereals and Bakery	3.4	2.2
(1) Laundry and Cleaning Supplies	3.1	2.0
	63.2%	55.1%

Nitrous Oxides (11,171 million lbs.)		
(10) Household Utilities	41.7	3.9
(9) Autos, Parts, and Repair	7.2	8.9
(8) Insurance	5.2	10.4
(7) Apparel	4.6	5.7
(6) Meat, Poultry and Eggs	3.8	5.4
(5) Shelter and Other Realty	3.1	11.4
(4) Toiletry Items	3.0	2.7
(3) Medical Services	2.5	5.9
(2) Footwear and Accessories	2.2	1.8
(1) Laundry and Cleaning Supplies	2.2	2.0
	75.5%	58.1%

Carbon Monoxide (9,231 million lbs.)		
(10) Autos, Parts, and Repair	33.7	8.9
(9) Shelter and Other Realty	16.7	11.4
(8) Meat, Poultry and Eggs	3.9	5.4
(7) Toiletry Items	3.7	2.7
(6) Household Paper Supplies	3.3	.3
(5) Apparel	3.1	5.7
(4) Insurance	3.0	10.4
(3) Newspapers	2.8	.5
(2) Laundry and Cleaning Supplies	2.6	2.0
(1) Dairy Products	2.5	2.5
	75.3%	49.8%

*Pollution index used to derive aggregate rank scores is discussed in Section 4.0.

TABLE 2 (cont.)

AIR POLLUTANTS (1970)

Hydrocarbons (17,620 million lbs.)

	Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
(10) *	Autos, Parts, and Repair	30.4	8.9
(9)	Shelter and Other Realty	14.7	11.4
(8)	Meat, Poultry and Eggs	7.0	5.4
(7)	Apparel	5.4	5.7
(6)	Insurance	3.8	10.4
(5)	Dairy Products	2.9	2.5
(4)	Toiletry Items	2.9	2.7
(3)	Fruits and Vegetables	2.9	2.5
(2)	Cereals and Bakery	2.6	2.2
(1)	Medical Services	2.3	5.9
		74.9%	57.6%

Sulfur Oxides (76,922 million lbs.)

	Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
(10)	Apparel	26.2	5.7
(9)	Household Utilities	25.6	3.9
(8)	Autos, Parts, and Repair	9.5	8.9
(7)	Shelter and Other Realty	3.7	11.4
(6)	Insurance	3.3	10.4
(5)	Floor Coverings	3.2	.3
(4)	Household Textiles	2.8	.5
(3)	Meat, Poultry and Eggs	2.5	5.4
(2)	Footwear and Accessories	1.9	1.8
(1)	Recreational Transportation	1.7	1.8
		80.4%	50.1%

TABLE 3.3

SOLID WASTE (1970)

	Consumer Items	Percent of Total Pollution	Percent of Aggregate Consumption Expenditures
(10)	Meat, Poultry and Eggs	31.0	5.4
(9)	Autos, Parts, and Repair	17.8	8.9
(8)	Shelter and Other Realty	9.1	11.4
(7)	Dairy Products	8.3	2.5
(6)	Household Utilities	7.1	3.9
(5)	Fruits and Vegetables	5.7	2.5
(4)	Cereals and Bakery	2.7	2.2
(3)	Apparel	2.0	5.7
(2)	Tobacco	1.7	1.2
(1)	Fats and Oils	1.5	.5
		86.8%	44.2%

*Pollution index used to derive aggregate rank scores is discussed in Section 4.0.

In the preceding tables it is apparent that many categories re-appear consistently among the top 10 for each pollutant type. In order to specify more precisely both the frequency and position of occurance in these 10 top categories, the summed ranks for all 12 pollutants were used to derive an aggregate pollution index for each consumer category. The rank ordering was found to be:

Name	Score *
Meat Poultry and Eggs	99
Apparel	72
Autos, Parts, and Repair	68
Dairy Products	65
Shelter, and Other Realty	46
Fruits and Vegetables	44
Household Utilities	41
Cereals and Bakery	40
Toiletry Items	38
Insurance	32
Laundry and Cleaning Supplies	19
Tabacco	19
Medical Services	18
Drugs and Medical Equipment	13
Fats and Oils	13
Household Paper	10
Sugar and Confections	5
Floor Coverings	5
Household Textiles	4
Footwear and Accessories	4
Newspapers	3
Alcoholic Beverages	1
Recreational Transportation	1

These categories, then, can be looked at as contributing a major portion of pollution in the U.S. economy. Thus, consumption patterns for these items become the focal point in any discussion of reducing pollution by reduction of consumption of highly polluting items.

Consumption patterns for three main classifications will be examined: income, age-of-head of household, and region of the U.S. These classifications for analysis of consumption patterns were chosen as indicators of the major differential consumer groups in the U.S. society. An analysis of these three sets of consumer groups will indicate the differential consumer patterns which influence market decisions, and thus

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*Scores were obtained by summing ranks shown in Tables 3.1-3.3 (the maximum possible score is 120).

differential methods of reducing pollution by affecting consumption patterns. In the analysis of the three groups which follows, it became apparent that only two of the groups--income and age-of-head of household--revealed major differences which were important indicators of buying habits which could be affected by policy decisions. Regional ✓ differences revealed no significant differences which were not accounted for in the analysis of the two other groups.

Figure 3 looks at pollution contributed by each income group for each of these 10 highest polluting items. It is obvious that the two highest income groups (which together include persons who earn over $10,000 per year) by their consumption of these ten items, over-contribute to the pollution problem. These two groups, comprising only 44% of the population, contribute an average 65% of the total pollution for these 10 items. The two lowest income groups, (which together include those who earn under $5000 per year) representing 29% of the population, contribute approximately 10% of the pollution. With respect to consumer items it is apparent that the lowest income groups contribute heavily to food and shelter items; the items in which the highest income groups contribute most are insurance, apparel, autos and toiletries--more apparent luxury items.

Figure 4 examines pollution contribution for each consumer item by age-of-head of household. Looking at the graph of average aggregate expenditures, it appears that the groups with age-of-head of household 25-54 "over-consume" compared to their relative size in the population. Especially high are the groups from age 35-54 which comprise 38% of the population but average 49% of the aggregate consumption expenditures and therefore 49% of the pollution contribution. The group with age-of-head of household 55-64 contributes an average 17% of the consumption expenditures and is 17% of the population. The two extreme groups, with heads of household under 25 and over 65, both "under-consume" relative to their size in the population. The over 65 age group is especially notable, as it comprises 19% of the population but averages only 7% of the aggregate consumption expenditures. The highest proportional expenditures for this over 65 group, are in food and shelter commodities, while the highest proportional expenditures for age groups ✓ 35-54 are in apparel, insurance, and toiletries. Thus, if a reduction in pollution is desired through a reduction in consumption expenditures, it seems obvious that attention should be focused on those groups who consume most heavily, that is, households in which the age-of-head of household is 25-54.

Figure 5 compares regional consumption expenditure differences (see Appendix for map of regional divisions). Relative to their proportions in the population, the Northeast and Northcentral regions over-consume. Comprising 24 and 27% of the population respectively, they contribute 27 and 29% of the consumption expenditures, and therefore of the pollution.

As Bud indicated -
- just because you have $ - 35-54 biggest income producing years
what are you to do with it? Activities could be developed
around these alternatives.

The purpose of the consumption model of pollution generation is to assign responsibility for pollution both to decision makers in production, and to consumers who demand the final products. Viewed from this perspective, there are essentially two ways in which to lower pollution: 1) to make changes in production methods or materials; and 2) alter consumption patterns. The following section will deal with consumption patterns of the ten highest polluting categories of personal consumption goods, and some of the issues involved in making changes in consumption patterns.

The ten categories of personal consumption items fall into two basic consumption patterns. Meat, Poultry, and Eggs; Dairy Products, Fruits and Vegetables, Cereals and Bakery, Toiletry items, Household Utilities, and Shelter and Other Realty constitute the first consumption pattern group, and Auto Parts and Repair, Apparel and Insurance, the second. Each of these consumption pattern groups will be examined [see Figures 6-10] according to consumption patterns which emerge for income and age-of-head of household groups.

Of the ten top ranking categories of personal consumption items scored in Section 4.0, four of them are foods: 1) meat, poultry and eggs, 2) dairy products, 3) fruits and vegetables and 4) cereals and bakery. The consumption patterns for all four categories of these personal consumption goods are similar. As income rises, the average dollars spent per household per year for these food categories increases. However, as income increases, the average proportion of the household budget spent on each food category decreases. Personal food consumption tends to be relatively inelastic in terms of quantity (calories) an individual consumes. The relative inelasticity would account for the proportionate decrease. Thus it appears that increases in expenditures for food reflects the buying of better quality foods which tend to be more expensive. This does not discount the probability of an increase in quantity food buying, though this would appear to be slight. As will be noted below, this increase in quantity buying will often be due to increased size of the family unit, which shows a high correlation with an increase in income. Thus the key issue raised in this respect is whether quality food products which generally demand higher prices are more polluting than food products of lesser quality of lesser expense. Determination of this issue will be essential to any wise decision in regard to alteration in consumption patterns of food products.

For the four food consumption categories, by age-of-head of household, average dollars spent per household per year is less for groups with the age-of-head of household under 25 and over 65, with the maximum amount being spent by the group with age of head 35-44. The proportion of the household budget is similar for all age groups, with a slight increase noted in the 65 and over age group. These consumption patterns basically reflect normal increase in family size and its decrease as the family grows up. Heads of households under 25 years old or over 65 reflect the times in life when families are just beginning to grow or after the children have left their families leaving parents alone. The 35-44 age groups of heads of households is the time when persons find their maximum number of children at home. This appears to account for most of the expenditure patterns by age of household.

Both the age-of-head of household and the income level consumption patterns for the four food categories reflect no excessive over-consumption by any group. The foods in these four personal consumption categories are considered basic necessities, of which consumption cannot be cut below a certain point without affecting health. It would appear that changes in production methods and materials will be the more effective way of dealing with pollution from the food categories than trying to alter their consumption patterns.

✓

✓

The consumption patterns for toiletries are similar to the patterns for the food categories. As income increases, total dollars spent on toiletries increases, and the proportion of total budget decreases, but at a lesser rate than on the decrease noted on food categories. These patterns are consistent in regard to demand changes because of family size increase and quality, as has been explained in previous paragraphs. However, it appears that the demand curves for toiletries is relatively elastic thus indicating much of toiletries consumption is not of an "essential" type. Such would indicate that alteration of consumption patterns in this category would be an effective means of pollution reduction.

The third major category in the first consumption pattern group is shelter categories which include: 1) shelter and other realty and 2) home utilities. As with the four food categories, as income increases, the average dollars spent increases, and the proportion of the total family budget spent on shelter and utilities decreases. But this proportional decrease falls at a faster rate than food categories, and the dollars spent increases at a slightly faster rate. The consumer groups with age-of-head of household between 25-64 spend the highest dollar amounts and the lowest proportion of household budget on shelter. Only the under 25 age-of-head of household group spends a lower proportion on home utilities. There does exist, as noted before, a high correlation with age-of-head of household, income level and family size. Responsibility for increased family size and increasing income level as age increases reflects a consistent expenditure pattern in the shelter categories.

2.3 Do a survey of advertisements on television during prime time (7 P.M. - 10:00 P.M). Indicate the number of commercials that are for products in the major polluting industries in contrast to the number of those commercials which are not among the main polluting industries.

B. Comparison of large urban picture

1. National

ACTIVITY II-B-1

In what ways do urban ecosystems play a central role in promoting the industries which cause so much pollution.

1.1 Find out which are the 10 largest cities in the United States and record the populations of each city.

1.2 Find out the total population in the U.S. and then determine what percent of the total U.S. population lives in the 10 most populated cities.

1.3 Find out the area in square miles of each of the 10 cities. Calculate what percent of the total land mass of the U.S. is occupied by the percent of people living in the 10 largest cities.

1.4 Some people have the opinion that "once you see one city you have seen all cities". Using your knowledge about the urban ecosystem write a short composition that explains what is meant by the above quote.

1.5 The urban centers of the U.S. are said to be in trouble. Make a list of 5 to 10 major problems facing the urban centers.

1.6 For each of the problems identified as a common problem of urban centers try to name the cause or group of causes related to the problem.

2. International

ACTIVITY II-B-2

2.1 Find out what are the 10 largest cities in the world. Among other sources, check with an almanac for this information. At the same time find out what the population of each city and the total land area of each city (metropolitan area).

2.2 What percent of the total world land mass is taken up by the 10 most populated urban centers of the world. Now calculate what percent of the world's population lives on this percent of land.

What is the latest figure for the population of the world?

2.3 Select three of the major cities of the world such as Nairobi, Tokyo, Moscow, New York and find out the 5 or so major problems faced by the residents of such cities. Check with UNICEF for possible information. What are the health issues faced by the residents? How does housing, health care, and environmental pollution compare among the international cities?

(Picture - 'The Changing City')

Here is a series of three pictures of the exact same place in a city taken over a thirteen year period.

1. Can you find pictures of your city which shows a similar change. Check through some local history books.

2. The pictures here are from a European city. In your own words tell (a) what happened in the city? (b) Where did the people go to live? (c) What was the reasons for changing the city so drastically? (d) What problems do you think were solved by changing the city? (e) What problems were created by the changed conditions of the city?

The Changing City

How does a charming European city turn into a faceless, neon-lit, automobile-oriented metropolis?

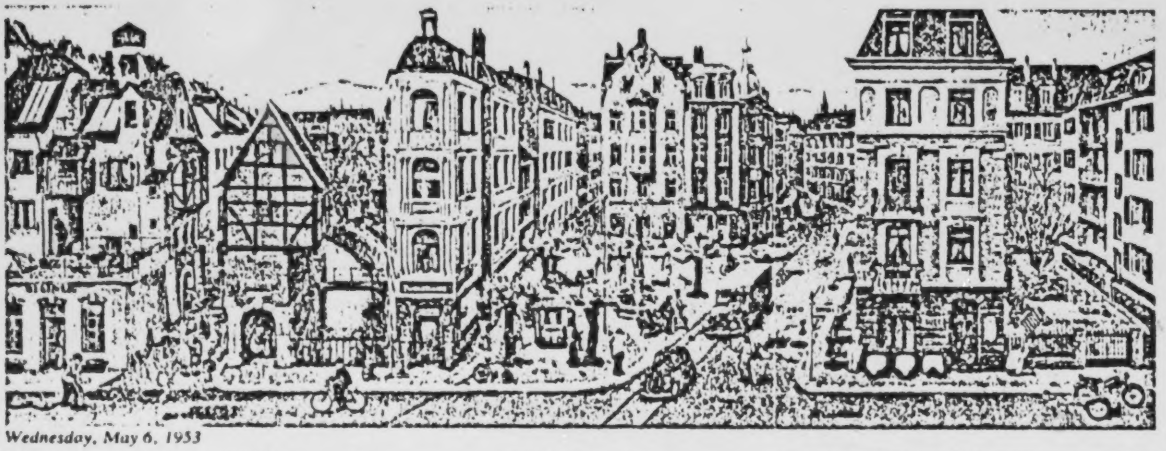
In a series of eight fold-out paintings (three of which are reproduced here), Swiss artist Jörg Müller has charted the step-by-step progress of urban decay. By showing the same section of the city at approximately three-year intervals, Müller demonstrates in remarkable detail the pressures for increased space and convenience that bring about the city's metamorphosis.

Because of lack of planning, the once-charming city loses both its personality and original purpose. Although Müller based his paintings on his study of a number of Swiss and German cities, the decline he pictures is true of the urban scene in our country as well.

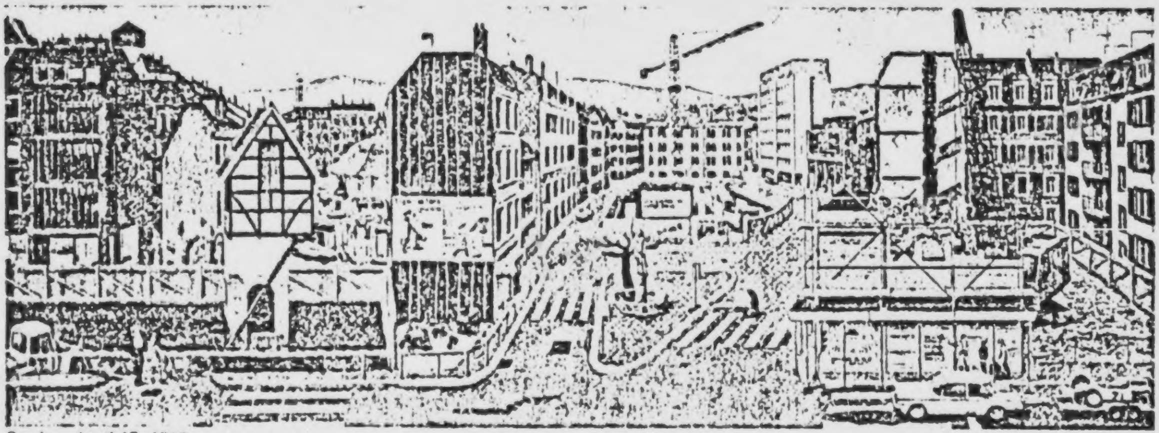
Without using a line of text, Müller has pinpointed an urgent contemporary dilemma.

C.B.

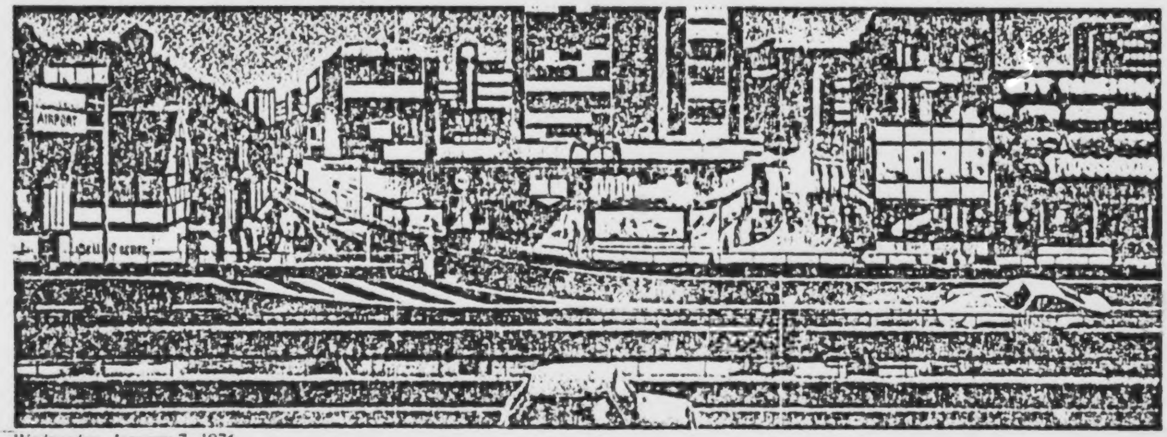
The Changing City, by Jörg Müller (A Margaret K. McElderry Book). © 1976 by Verlag Sauerlander. Used by permission of Atheneum Publishers.



Wednesday, May 6, 1953



Sunday, April 17, 1966



Wednesday, January 7, 1976

ACTIVITY III-A-1

A. Definition

Environmental health is a term that has at least two main ideas in it - one is the way the environment or our living and working surroundings effect our health. The second is the effect of what man does to the condition of the environment. For our purposes in the next few exercises we will think of the definition in terms of the ways living in the urban ecosystem affects the conditions of health of those that reside in the city.

As we have indicated and you have learned up to now, the urban ecosystem is a complex of interrelated systems related to commerce and industry, all of which involves millions of people in the labor force and vast amounts of energy and technology.

1. Environmental Factors

The enviornmental factors that affect the state of physical and mental health have to do with the conditions of where people live and work; with who they are to themselves and to others i.e., what roles they take in the various aspects of their life; and with the politics of all the conditions in their lives. Underlying the systems are the socioeconomic factors of the individuals and their families. The socioeconomic factors have to do with how much income you have, what ethnic group you are of and what extent of your education is. These factors influence greatly, where one lives, what income one has, the availability of quality health services and other public services, among other things.

Cultural factors determined by one's ethnic group also influence greatly consumer patterns, choice of housing, educational aspirations and occupations.

2. Urban Health Problems

ACTIVITY III-A-2

Below are vital statistics from New York City for 1977.

1) What were the leading causes of death among your age group, and what are the agents that are believed to be related to the cause of death? Ask your teacher to help you define any words you do not understand.

2) What were the leading causes of death in each Borough, and identify the agents related to the cause of death?

City of New York, 1975

Males			Females	
Deaths	Percent		Deaths	Percent
		ALL AGES		
16,235	39	Heart Diseases	11,567	42
8,850	21	Malignant Neoplasms	8,034	23
2,105	5	Cerebrovascular Diseases	2,671	8
1,534	4	Influenza and Pneumonia	1,316	4
1,673	4	Cirrhosis of Liver	675	2
730	2	Diabetes Mellitus	993	3
1,347	3	Homicides	284	1
1,018	2	Accidents	518	1
7,848	20	All Other Causes	5,975	16
41,219	100	Total	35,063	100
		UNDER ONE YEAR		
200	17	Congenital Anomalies	150	16
144	12	Immaturity	125	13
140	12	Postnatal Asphyxia and Atelectasis	100	11
111	9	Sudden Infant Death Syndrome	88	9
54	5	Influenza and Pneumonia	52	6
27	2	Gastrointestinal Diseases	24	4
20	2	Birth Injuries	19	2
379	32	Other Diseases of Early Infancy	312	33
96	9	All Other Causes	69	6
1,171	100	Total	939	100
		1 TO 14 YEARS		
105	25	Accidents	52	17
84	20	Malignant Neoplasms	54	18
53	13	Congenital Anomalies	43	14
28	7	Influenza and Pneumonia	15	5
22	5	Homicides	20	7
16	4	Diseases of Nervous System and Sense Organs	20	7
13	3	Infective and Parasitic Diseases	5	2
4	1	Diseases of the Digestive System	9	3
98	22	All Other Causes	82	27
423	100	Total	300	100
		15 TO 24 YEARS		
313	29	Homicides	61	15
155	14	Drug Dependence	52	12
138	13	Accidents	42	10
73	7	Malignant Neoplasms	44	10
52	5	Suicides	33	7
22	2	Heart Diseases	9	2
19	2	Congenital Anomalies	12	3
13	1	Diseases of Nervous System and Sense Organs	13	3
14	1	Influenza and Pneumonia	12	3
293	26	All Other Causes	160	35
1,092	100	Total	441	100
		25 TO 44 YEARS		
389	11	Malignant Neoplasms	442	25
677	19	Homicides	110	6
461	13	Cirrhosis of Liver	180	10
413	11	Heart Diseases	181	10
266	7	Accidents	71	4
233	6	Drug Dependence	54	3
186	5	Suicides	87	5
100	3	Cerebrovascular Diseases	71	4
932	25	All Other Causes	570	33
3,657	100	Total	1,766	100
		45 TO 64 YEARS		
4,510	39	Heart Diseases	2,056	28
3,040	27	Malignant Neoplasms	2,977	40
864	8	Cirrhosis of Liver	327	4
419	4	Cerebrovascular Diseases	391	5
290	3	Influenza and Pneumonia	187	3
235	2	Diabetes Mellitus	223	3
236	2	Other Diseases of Digestive System	207	3
235	2	Accidents	97	1
1,596	13	All Other Causes	986	13
11,455	100	Total	7,451	100
		65 AND OVER		
11,276	48	Heart Diseases	12,315	51
5,271	22	Malignant Neoplasms	4,516	19
1,472	6	Cerebrovascular Diseases	2,195	9
1,065	5	Influenza and Pneumonia	1,039	4
456	2	Diabetes Mellitus	741	3
521	2	Other Diseases of Digestive System	547	2
508	2	Other Diseases of Circulatory System	550	2
257	1	Accidents	252	1
2,646	12	All Other Causes	2,021	9
23,451	100	Total	24,166	100

(a) Eight leading causes of death in each age group arranged in order of importance for both sexes combined.

3) Of all the leading causes of death which are caused by germs or bacteria?

4) What were the leading causes of death 50 years ago? (See graph Conquest of Pestilence inNYC.)

5) Why do you think the leading causes of death have changed?

6) Select one or two of the major causes of death in the urban ecosystem and see if you can understand what the disease is about. When it starts, what causes it, and what measures are necessary to prevent it. Speak to an epidemiologist or public health educator, or a member of a community medicine department at a medical school.

B. Conditions of Health ACTIVITY III-B

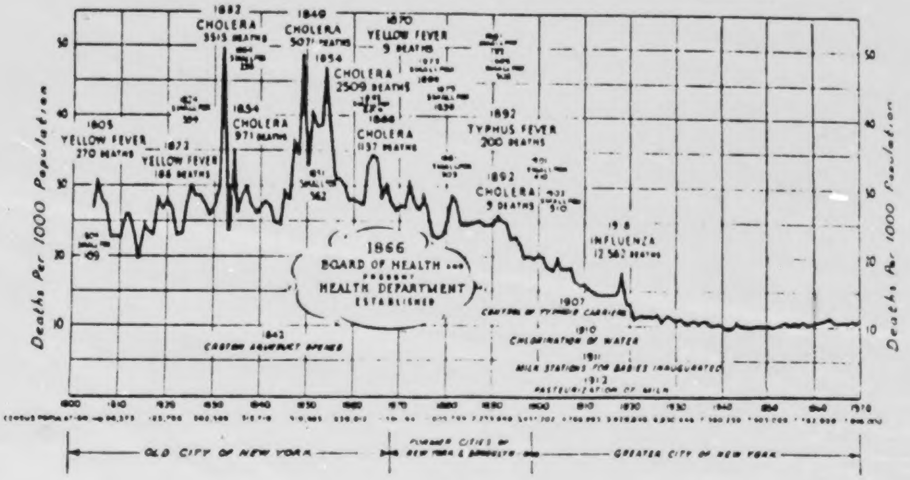
The condition of health is a broad concept. The concept considers the state of health from being sick, incapacitated with a terminal illness, to being disabled, i.e., sick in bed with a high fever; chronic conditions that effect growth and development, to conditions that restrain behavior; and finally conditions that increase or decrease pleasure and satisfaction.

1. Examine your neighborhood and make a list of the factors which influence you and your family's condition of health. List them into one of these categories:

Setting	Role	Political	Socioeconomic
1. No traffic lights in intersection.	1. Student cannot get a job.	1. Landlord will not make apartment improvements because laws are not enforced.	1. Do not make enough money to live in a different neighborhood.
2. Garbage all over the ground brings dogs cats and rats.	2. Nobody in family is employed.		

The CONQUEST OF PESTILENCE in NEW YORK CITY ~

... As Shown by the Death Rate as Recorded in the Official Records of The Department of Health.



1. Rate of Mortality ACTIVITY III-B-1

The rate of mortality is the death rate. The death rate is usually reported as the number of deaths per 1000 individuals. Public health specialists and epidemiologists study the death rate and the rate of illness in populations. You will recall that 26 people attending an American Legion convention in Philadelphia, Pennsylvania reported in sick and eventually died. There were over 10,000 (?) Legionaires and wives at the convention. Why should anyone be concerned if 26 people attending the convention died within a few days after leaving Philadelphia?

Individuals of all age groups die for different reasons. Stataticians have established norms or the mean number of deaths that can be expected in a year in a particular age group. Study the tables of the death rates in your class Almanac.

1. What was the death rate in different age groups over the past 5 years?
2. For what age group has the death rate increased/decreased/remained the same?
3. Compare the death rate of urban ecosystems compared to rural areas by age group. In which situation is the death rate higher/lower.
4. What are the leading causes of death in the country? List them in order of highest to lowest in terms of death rate.
5. What were the leading causes of death 20-30 years of ages?
6. Give some reasons to explain why the cause of death in the U. S. has changed.
7. What are the causes of the diseases which are now the chief cause of death in the U.S.

The causes of death in the urban ecosystem are representative of the causes of death for the nation as a whole. Below is a table showing the causes of death in New York City (1975) by health district residence.

Table 9b. Population Total Deaths and Selected Causes of Death by Health Center District of Residence, New York City, 1975

District	POPULATION ESTIMATES July 1, 1970	Deaths All Causes		Ischemic and Other Heart Disease		Malignant Neoplasms		Cerebrovascular Disease		Pneumonia and Influenza		Cirrhosis of Liver	
		No.	Rate*	No.	Rate**	No.	Rate**	No.	Rate**	No.	Rate**	No.	Rate**
NEW YORK CITY	7,896,000	76,312	9.7	29,973	379.6	16,893	213.9	4,676	59.2	2,880	36.5	2,348	29.7
KNOWN RESIDENTS	7,896,000	68,487	†	27,499	†	14,327	†	4,333	†	2,516	†	2,208	†
MANHATTAN	1,539,000	15,375	10.0	5,548	360.5	3,053	198.4	950	61.7	533	34.6	804	52.2
Central Harlem	183,000	2,448	13.4	753	411.5	410	224.0	135	73.8	72	39.3	203	110.9
East Harlem	157,000	1,216	7.7	384	244.6	199	126.8	82	52.2	53	33.8	86	54.8
Kips Bay-Yorkville	229,000	2,075	9.1	822	359.0	492	214.8	141	61.6	77	33.6	72	31.4
Lower East Side	249,000	2,258	9.1	788	316.5	469	188.4	104	41.8	78	31.3	120	48.2
Lower West Side	253,000	2,844	11.2	1,063	420.2	601	237.5	174	68.8	115	45.5	133	52.6
Riverside	220,000	2,000	9.1	794	360.9	395	179.5	134	60.9	64	29.1	95	43.2
Washington Heights	248,000	2,474	10.0	944	380.6	487	196.4	180	72.6	74	29.8	95	38.3
BRONX	1,472,000	11,535	7.8	4,460	303.0	2,315	157.3	655	44.5	396	26.9	379	25.7
Fordham-Riverdale	243,000	2,602	10.7	1,125	463.0	579	238.3	166	68.3	82	33.7	59	24.3
Morrisania	262,000	1,378	5.3	384	146.6	234	89.3	55	21.0	43	16.4	74	28.2
Mott Haven	213,000	1,028	4.8	307	144.1	155	72.8	60	28.2	36	16.9	62	29.1
Pelham Bay	206,000	2,250	10.9	957	464.6	530	257.3	132	64.1	87	42.2	40	19.4
Tremont	259,000	1,502	5.8	501	193.4	234	90.3	65	25.1	56	21.6	76	29.3
Westchester	289,000	2,775	9.6	1,186	410.4	583	201.7	177	61.2	92	31.8	68	23.5
BROOKLYN	2,602,000	21,493	8.3	8,777	337.3	4,448	170.9	1,275	49.0	840	32.3	560	21.5
Bay Ridge	272,000	2,744	10.1	1,252	460.3	634	233.1	157	57.7	76	27.9	49	18.0
Bedford	276,000	1,921	7.0	573	207.6	365	132.2	128	46.4	84	30.4	89	32.2
Brownsville	319,000	1,885	5.9	641	200.9	397	124.5	103	32.3	78	24.5	57	17.9
Bushwick	230,000	1,518	6.6	562	244.3	267	116.1	89	38.7	65	28.3	56	24.3
Flatbush	489,000	4,549	9.3	2,030	415.1	982	200.8	279	57.1	167	34.2	68	13.9
Fort Greene	199,000	1,427	7.2	444	223.1	220	110.6	90	45.2	92	46.2	76	38.2
Gravesend	316,000	3,427	10.8	1,591	503.5	814	257.6	199	63.0	103	32.6	37	11.7
Red Hook-Gowanus	141,000	1,047	7.4	401	284.4	207	146.8	47	33.3	58	41.1	37	26.2
Sunset Park	184,000	1,645	8.9	734	398.9	322	175.0	111	60.3	72	39.1	35	19.0
Williamsburg-Greenpoint	176,000	1,330	7.6	549	311.9	240	136.4	72	40.9	45	25.6	56	31.8
QUEENS	1,987,000	17,666	8.9	7,665	385.8	3,968	199.7	1,312	66.0	649	32.7	411	20.7
Astoria-L.I.C.	250,000	2,518	10.1	1,070	428.0	564	225.6	187	74.8	105	42.0	75	30.0
Corona	256,000	2,161	8.4	888	346.9	481	187.9	159	62.1	91	35.5	48	18.8
Flushing	483,000	3,653	7.6	1,632	337.9	867	179.5	274	56.7	143	29.6	47	9.7
Jamaica East	344,000	2,553	7.4	984	286.0	545	158.4	173	50.3	94	27.3	95	27.6
Jamaica West	359,000	3,564	9.9	1,651	459.9	718	200.0	248	69.1	113	31.5	84	23.4
Maspeth-Forest Hills	295,000	3,217	10.9	1,440	488.1	793	268.8	271	91.9	103	34.9	62	21.0
RICHMOND	296,000	2,418	8.2	1,049	354.4	543	183.4	141	47.6	98	33.1	54	18.2
RES. OF INSTITUTIONS	....	2,762	...	1,104	...	1,022	...	157	...	217	...	3	...
KNOWN NON-RESIDENTS	....	4,403	...	1,181	...	1,477	...	165	...	125	...	76	...
PERMANENT RESIDENTS UNKNOWN	....	660	...	189	...	67	...	21	...	22	...	61	...

* Rate per 1,000 population.

** Rate per 100,000 population.

† This figure is not computed because known resident totals include only events occurring in New York City to known residents, and do not include events occurring outside of city in New York City Residents.

1. Examine the table and identify the leading causes of death in New York City. In what way, if any, do the top 5 causes of death in the City differ from those top 5 causes of death in the nation?

2. Examine the column "Death All Causes" for your borough has the highest death rate, lowest death rate? Speculate as to why this is true.

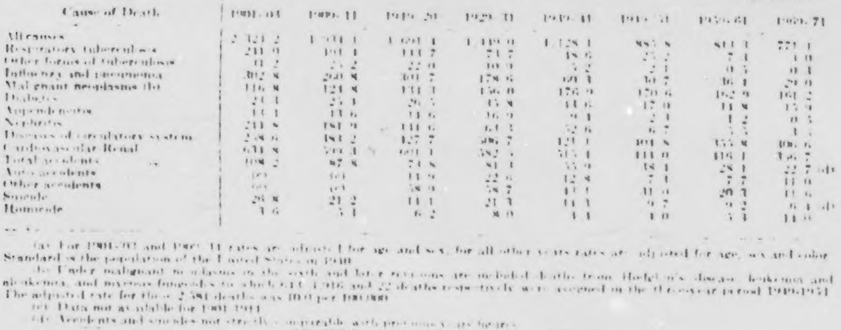
3. Compare the death rate by each borough and place them in rank order from the highest death rate to the lowest death rate. Are you surprised by the data in any way? If so explain.

4. On the basis of lowest death rate where might be the best area to live in New York City?

5. What borough has the lowest death rate from cancer; the highest?

6. What area has the lowest death rate from cancer; the highest?

Table 15. Age-Adjusted Death Rates (a) Certain Causes, Per 100,000 Population, City of New York, 1901-1971



7. Examine table 15, "Age-Adjusted Death Rates (a) Certain Causes, Per 100,000 Population, City of New York, 1901-1971". Identify which diseases have dropped to almost no deaths over the years. List them.

8. Which diseases have increased the most over the past 70 years. List them.

9. What data gives you the most cause for concern? What environmental factors do you think might be contributing to the increase of the diseases you have identified in question number 8? Discuss this with your class and write a short essay on the topic of environmental influences in the cause of death in New York City.

2. Rate of Disability

Poor mental and physical health are of serious importance to the patient and to the society as a whole. It is becoming more evident as the research data on modern diseases comes in that there is an interplay between an individuals mental health and their physical health. Simply this means that an individual who is sick in body will to some degree have their mental state affected by the condition of being sick. In a like manner an individual who is mentally upset, neurotic, anxious, depressed or psychotic may likely have physical sickness as well.

When you are sick or someone in your family is sick you know how the attention to other daily matters are directed to treat the sickness and to comfort the sick person. When adults who work are sick the work that they do does not get done during the time they are outside. This fact may not seem too important when you think of only one or two people being out sick from a job. However, if you were to imagine that the total labor force in the U.S. is   , and if one or two percent of the labor force is out sick every day, that means a great deal of work that could and should be done for these days, does not get done. If you imagine that every day in the country 2-3% of the work does not get done this results in an overall decrease in the national product - what the nation produces in products and services. This has a serious affect on the economy.

Below is some data on days of work lost by various industries. Study the table and answer the following questions.

1. Which 5 industries have the largest loss of days worked?
2. What possible relationships do you suspect may exist between the type of work required by an industry and the loss of days of work by that industry?
3. How does a teachers absence affect the school budget and student learning?
4. What 5 industries have the lowest loss of days worked?
5. What possible relationship might exist between these industries and their employees that cause them to miss relatively fewer days off than those you noted in question number one?
6. Suppose a major epidemic were to strike an urban center such as New York City - outline the impact to families, (income), the industry, local and to related industries local and remote.

For the most part many features of the urban environment (or any environment for that matter), which are thought to cause a harmful effect upon human health and well-being do not show effects on morbidity (illness) and mortality (death), during a period of time they are available for observation. Further many of these adverse effects to human health and well-being caused by the environment or not observed because more serious causes of ill health are in effect. For example a person who lives in a neighborhood where a paint factory is located may develop a related chronic respiratory condition. However, should the individual have inherited diabetes, cerebral palsey, a congenital heart problem, their life may end as a result of these, before the adverse effects of the environment would have time to be manifest.

More than 700,000 people live in the vicinity of JFK International Airport, many of which had their sleep interrupted by the low flying aircraft. There are about 266 schools, attended by 275,000 pupils whose schooling is interrupted by aircraft noise. In the same area church services, community meetings, outdoor conversations, and outdoor gatherings were inhibited or interfered with by the noise. The presence of the airport, therefore prevented large numbers of people from carrying out activities they wished to carry out. Some of the people were also constrained to carry out other activities which they would not ordinarily have carried out, for example installing air conditioners in houses, so they would not have to open windows, sound proofing apratments, houses, and moving to other areas. (Hinkell pp. 220 - 221)

Constraints on behavior are things in the environment that force you to behave in a certain way or force you not to behave in a certain way. In our daily lives we encounter many constraints on our behavior. In these groups of activities we will think about environmental factors in the urban ecosystem which constrain behavior.

Neighborhood

1. Make a list of environmental factors in your neighborhood which constrain behavior of people living there. In this case think of physical factors.

2. For each factor in your physical setting listed above describe how each place constraints the behavior of people.

3. For each factor related to the roles individuals take in their home, or work, describe ways that social interaction constrain behavior.

4. In what ways do socioeconomic conditions constrain behavior?

5. Describe ways in which cultural preferences constrain behavior.

6. Describe ways in which the behavior of others constrain behavior. Think of travelling the subway; supermarket shopping; department store shopping.

Pleasure and Satisfaction Received ACTIVITY III-B-5

"Life is real and life is ernest", is often quoted by parents to young people growing-up. Young adults begin to get a glimpse of what is meant by the quote as they assume increasing responsibilities for their actions, or lack of actions. Some members of our society take the quote literally to the extent that life for them is only work and worry. There is more to life than work, and worry. Indeed there is pleasure and satisfaction. Perhaps in the past little attention has been given to helping people develop this dimension of their lives.

How we feel about our self, how we perceive the world around us and how we feel physically are important factors in governing the pleasure and satisfaction we receive from our daily lives. All of the factors that we have considered thus far in this unit, where we live, work; who we work, live with, our ability to take meaningful roles, to interact with our peers and the community at large in a meaningful way and having the economic where with all to have amenities are all important to the amount of pleasure and satisfaction we receive from life. Pleasure and satisfaction received is the most subjective of the condition of health categories we have been learning about.

Different age groups have different views of what gives pleasure and satisfaction. (Pleasure is considered here in the long run not the short.) Momentary pleasures that bring pain, suffering and discomfort to self or others is not considered pleasure as we think about it.) Different members of similar age groups also view pleasure and satisfaction differently . This next activity will help you develop some understanding of the concept, pleasure and satisfaction received.

1. Develop a questionnaire to be given to some of your friends and acquaintances in your age group. The questionnaire might include such items as:

   a) What does pleasure mean to you?

   b) *What are things/experiences which give* you pleasure?

   c) Rank order the things/experiences that give you pleasure in order of most pleasure to least pleasure.

   d) Five years from now try to imagine what will give you pleasure, and note what items are different from your list in C.

   e) What is required in your life to increase the pleasure or to change the order of what gives you pleasure now.

   f) What behavior changes do you think are required of yourself to increase the pleasure you receive?

You may rephrase each of the preceeding questions substituting the word satisfaction. Try doing the questionnaire with 3-4 peers. After you have collected all the information, write a summary of the interviews, titled: Pleasure and satisfaction received among my peers. If time allows, do the same interview with male parents/guardians and then with female parents/guardians. An expanded study could include visiting people working in different occupations.

2. Analyze the table below in terms of the pleasure and satisfaction you think the worker in each category receives (p.237 Hinkle). Then compare your assessment with the second table - Attitudes Towards Certain Aspects of the Environment(Hinkle P. 238).

IV. Quality of Life in Urban setting as affected by Environmental Factors

ACTIVITY IV-A

At no other time in American history has the average person had the advantage of such a vast range of alternative activities both in work and play. Moreover, there is ample free time and wealth to allow the majority of people the opportunity to realize their individual goals. However, segments of the American populace expresses general restlessness and discontentment. Dissatisfaction stems from different reactions to conditions and the multiplicity of objectives and subjective methods by which people evaluate their conditions.

What is difficult to explain is why the growth of material wealth usually associated with a high quality of life has not resulted in a perceived improvement in the quality of life. Perhaps it is because levels of expectations have risen faster than material improvements. It seems that as the general level of living improves and physical needs evolve into more complex preferences, expectations, and aesthetic as well as social values. Old ideas of what was good in both material and non-material standards are giving way. People now seem to be concerned with needs such as: 1) material goods which are safe, durable, and easy to maintain; 3) safe, public association with other human beings; 3) accessible open spaces for play or contemplation; 4) trustworthy information media; 5) time to be sick, idle, or creative.

Needs

ACTIVITY IV-A-1

Some people are trying to develop an index whereby selected information is analyzed to determine the quality of life of an individual or a group.

1. Make a list of at least 7 factors that you think are important in assessing the quality of life. Which three factors do you think influence all other factors?

2. Describe what factors need to be improved in your life situation that would improve the quality of your life.

3. In your judgment what needs must be met in order for an individual to have a high quality of life? Make a list of these and be prepared to discuss them in class.

One group of researchers into the quality of life issue has identified six categories of quality of life factors. Use the following table of major factors and examples of objective indicators to help you with this next activity.

1. Make a list of the categories the group considered to be most important in determining the quality of life.

2. Which of your categories matches those in the table?

TABLE 2

QUALITY OF LIFE FACTORS*

Major Factors	Objective Indicators (Examples)**
1. Economic Environment:	
Income	-Per capita disposable income -Median family income
Income Distribution	-Gini coefficient of income distribution
Economic Security	-Income support -Wealth measures
Work Satisfaction	-Accident, productivity, and turnover rates
2. Social Sector:	
Family	-Marriage and divorce rates -Illegitimate births
Community	-Social Responsibility Scale
Social Stability	-Upward social mobility -Social disorder incident rates
Physical Security	-Violent crime rates
Culture	-Human effort directed toward the arts
Recreation	-Persons participating in outdoor recreation and average days per person

*Examples of the methodology for determining subjective factors is given in Appendix B.

**This is not intended to be an exhaustive listing.

TABLE 2 (Continued)

QUALITY OF LIFE FACTORS

Major Factors	Objective Indicators (Examples)
3. Political Environment:	
Electoral Participation	-Per cent of registrants voting
Non-Electoral Participation	-Bloomberg & Rosenstock's "Action Score"
Government Responsibility	-Budget allocations -Per capita distribution of funds
Civil Liberties	-Rights Commission -Citizen review board
Informed Constituency	-Content analysis of mass media
4. Health:	
Physical	-Infant mortality rate -Physicians/capita -Health care facility utilization
Mental	-Persons in mental hospitals/population -Per cent of patients "cured"
Nourishment	-Per capita consumption of food types -Nutrients consumed per day per capita

TABLE 2 (Continued)

QUALITY OF LIFE FACTORS

Major Factors	Objective Indicators (Examples)
5. Physical Environment:	
Housing	-Per cent deteriorated houses -Per cent lacking plumbing -Per cent overcrowded
Transportation	-Family costs -Per cent budget allocated to construction and maintenance
Public Services	-Cost of gas and electricity -Frequency and coverage of services
Material Quality (both goods & services)	-Product life -Automobile recalls -Cost and frequency of repairs
Aesthetics	-Litter; Billboards -Trees preserved and planted
6. Natural Environment:	
Air Quality	-People exposed to sub-standard conditions -Concentration of CO, NO_2, SO_2
Water Quality	-BOD; Coliform count -Turbidity; Temperature; pH
Radiation	-Amount of radioactivity in water, soil, people
Toxicity	-Lead concentrations -Cases of lead poisoning
Solid Wastes	-Pounds/capita -Amount recycled -Frequency of collection
Noise	-Community Noise Reference Scale (under development)

3. Which of your categories are not represented in the table? Discuss in a short paragraph why you think your category should be included in the table?

4. Rank order the major factors in the table from most important to least important, in terms of their importance in influencing the quality of your life?

5. For a moment think of yourself as a head of a household - like your mother, father or quardian. Now rank order in terms of importance the factors which for you would have the most influence in terms of your quality of life.

Attitudes

ACTIVITY IV-A-2

Attitudes are important in determining what people consider to be a good quality of life or a poor quality of life. Attitudes are subjective personal feelings that everyone has.

1. How do you think attitudes are developed in people?

2. What events or circumstances in your life do you think are/were most important in developing your attitudes?

3. To get some idea of what your attitudes are write a short paragraph about the following:

This I believe about:

Parents:

The American Flag:

The Church:

Schools:

4. Discuss the reason why two individuals from the same neighborhood may have two very different opinions about the quality of their life i.e., one feels that the quality of their life is tops and another feels that the quality of their life leaves much to be desired?

B. Risk and Adaptation - its relationship to life. ACTIVITY IV-B

What an individual achieves in life is for the most part related to their values and goals. Values are difficult to understand sometimes because they are so much a part of our total environment that they do not readily stand out. Values might in the first instance be thought of as what our parents teach us from birth i.e., what is right/wrong, and good and bad. These teachings are very much influenced by their cultural backgrounds, religious affiliation and education. As one grows up these early parental values are influenced by social/political values of the society in which one lives. In this way, it is not surprising to find individuals in similar communities to hold similar values and individuals from different communities to hold different values. Often the further in time and space that people are removed from each other the greater their differences in values are. For example, compare the difference in values of people living on the east side and west side of town. Now consider all the general values of people from your town with those of people living in a town in a different part of the country. Further consider the general values of those living in your country with those values of people living in different countries.

Values ACTIVITY IV-B-1-2-3

Goals and aspirations of individuals are to a great extent guided by their values. This makes sense. It would not seem logical that an individual would seek goals that were unfamilar.

1. Try to dertermine what values you hold. List as many as you can then see if you can combine them to come up with about seven main values that you hold about life.

2. From your list of values discuss in a small group what goals you have in life. From this discussion make a list of your life goals.

3. Describe what aspects of your environment have/are influencing your goals.

4. What 4 conditions of the urban ecosystem need to be improved to significantly change the quality of life from your point of view?

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Some Teacher Notes for Urban Ecosystem

some pollution can be controlled with existing knowledge. —

i) water (solid waste) ii) air ([illegible]) iii) noise — with the validity [illegible] in the [illegible] — [illegible] and [illegible] can make major improvements in these problems.

MACRO — environment — ecology — federal management — environmental [illegible] issues.

[illegible] — [illegible] — Assimilative service provided by the environment — self purification of [illegible]; dispersion of [illegible] over large distances, [illegible] of [illegible] —

MICRO — more difficult [illegible]

envir. [illegible]; NOT enough assimilative capacity of envir. to provide natural treatment — once waste escapes into the [illegible] of a city it remains until it is degraded —

Urban Neighborhood — programs — United nations vs.
" people

ethnicity
economic — [illegible] base ([illegible])
crime
traffic congestion
bad schools
bad housing
racial conflict

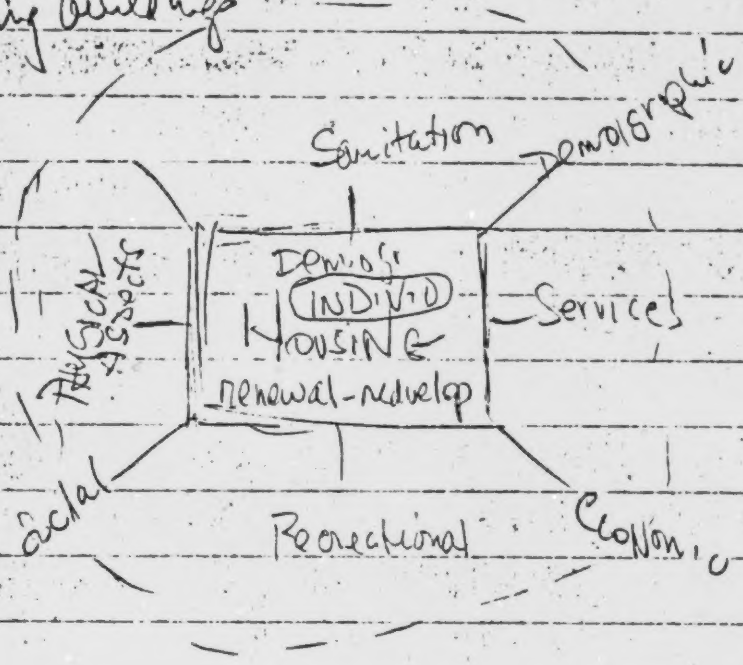
* — physical is part of the individual's identity [illegible] env. choice · [illegible] · so only in all these.

the urban env. & health

general
urban diseases

heart
mental
cancer
cirrosis

noise
litter
lack of accessible recreational space — pattern of behavior
crowding
vacant lots
decaying buildings



By Age group

females
69+, live in
urban —

definition of
neighborhood —
Physical or
social?

residential mobility - income
self help activities (adaptations)
intuitive prob solv- rather than
logic and reason

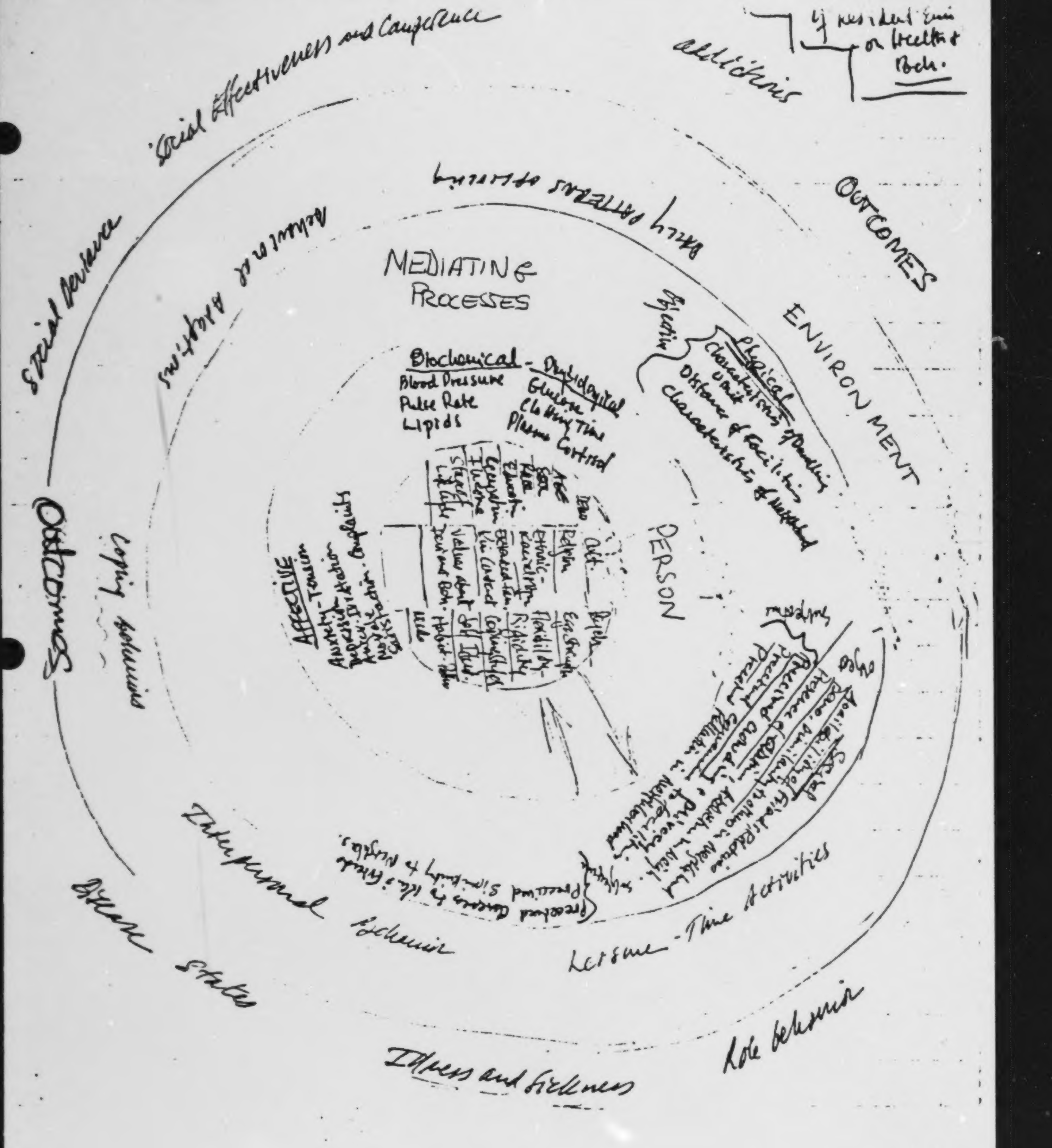
1) why do you live where you
do?
2) where would you life if
the $ did not limit
you?

total noise level.
morbidity –

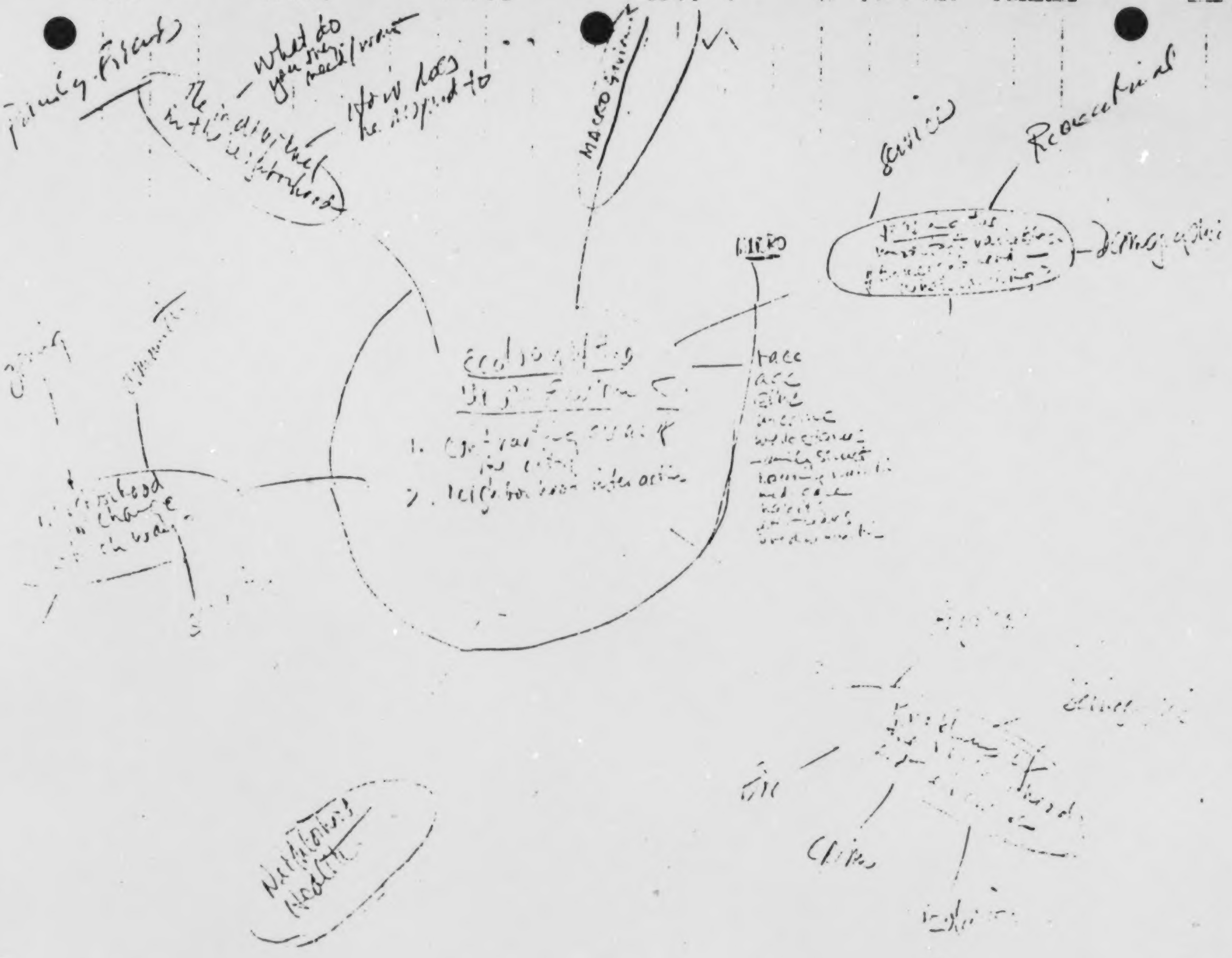
Urban ecology

1) study of contrasting areas of the city
2) neighborhood interaction
3.) physical parameters of housing
relocation - vol/invol.
its housing needs/satisf./attitudes, percepts.
4) proximate environmt - short term behavior
5) disease - social pathology –
6) (socio-eco. affluence; young marrieds, social isolation, social disequilibrium)
7) Social env. vs. Residential env.
8) correlates of poverty: race; age, educ., work status, family structure; housing, nutrition, medical care, habits, attitudes
participation
9.) social isolation; mobility; diverse social stress –
10.) data collected in studies – includes health data; area info.; and data on individual's perceptions of their environments.

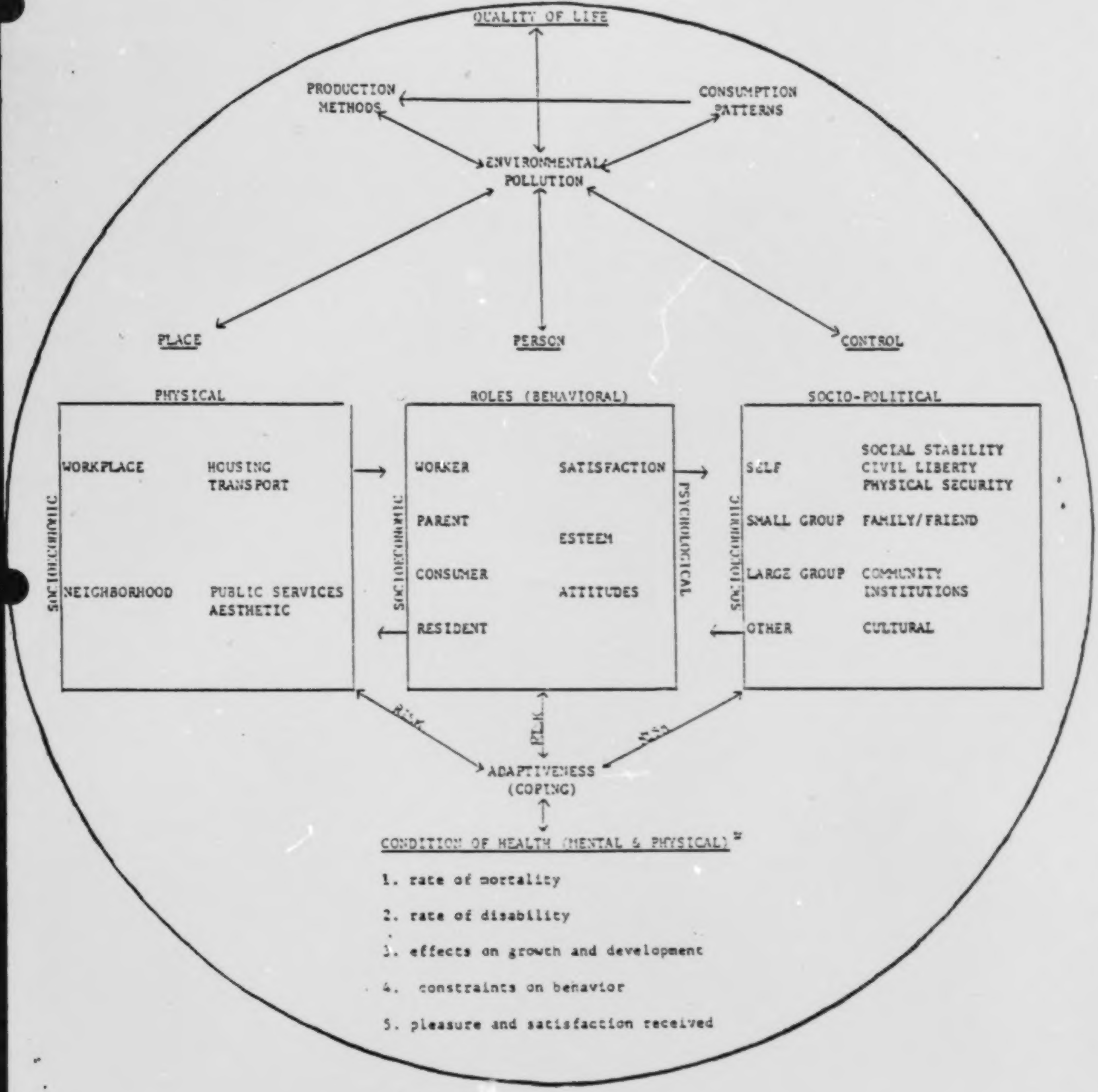
11) urban-suburban: edu; occupation; phys. activity; diet
availability of services; interpersonal contacts; attitudes; values and beliefs about medical services.
12.) noxious + dangerous elements in house
13) " behavior patterns " "
14) " perception of danger in / outside –
15.) physical dist. from friends + family
16.) child rearing values; leisure time interests; gen. art preferences



Stammerl Karl 1977)

family, friends
what do you say need/want
How does he respond to
The individual in the neighborhood
MACRO SYSTEM
MICRO
services
Recreational
demographics
race
age
1. [illegible]
2. neighborhood interaction
neighborhood change
Neighborhood Health
Clinics

SETH ENVIRONMENTAL HEALTH CURRICULUM



MULTIPLE BALANCE CONSTRUCT

*Hinkle, L., 1977

L.R. Sherman, 1977

- MACRO INPUTS

OUTPUTS

[illegible] Role

[illegible]

1. Housing – [illegible]
2. Services
3. Recreation
4. Physical – [illegible]
5. Social – Friends
   Relatives

[illegible]

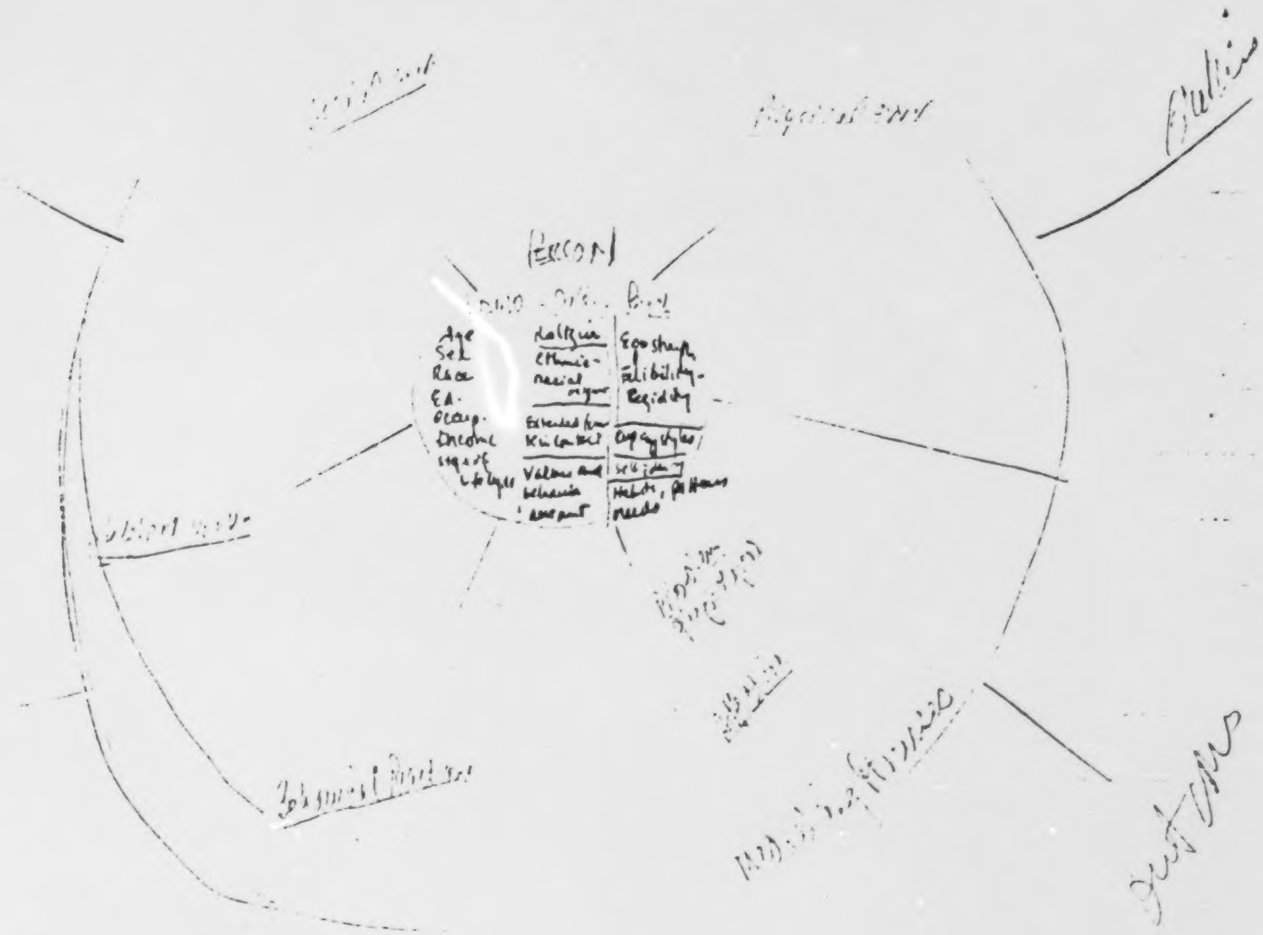
(6) [illegible]

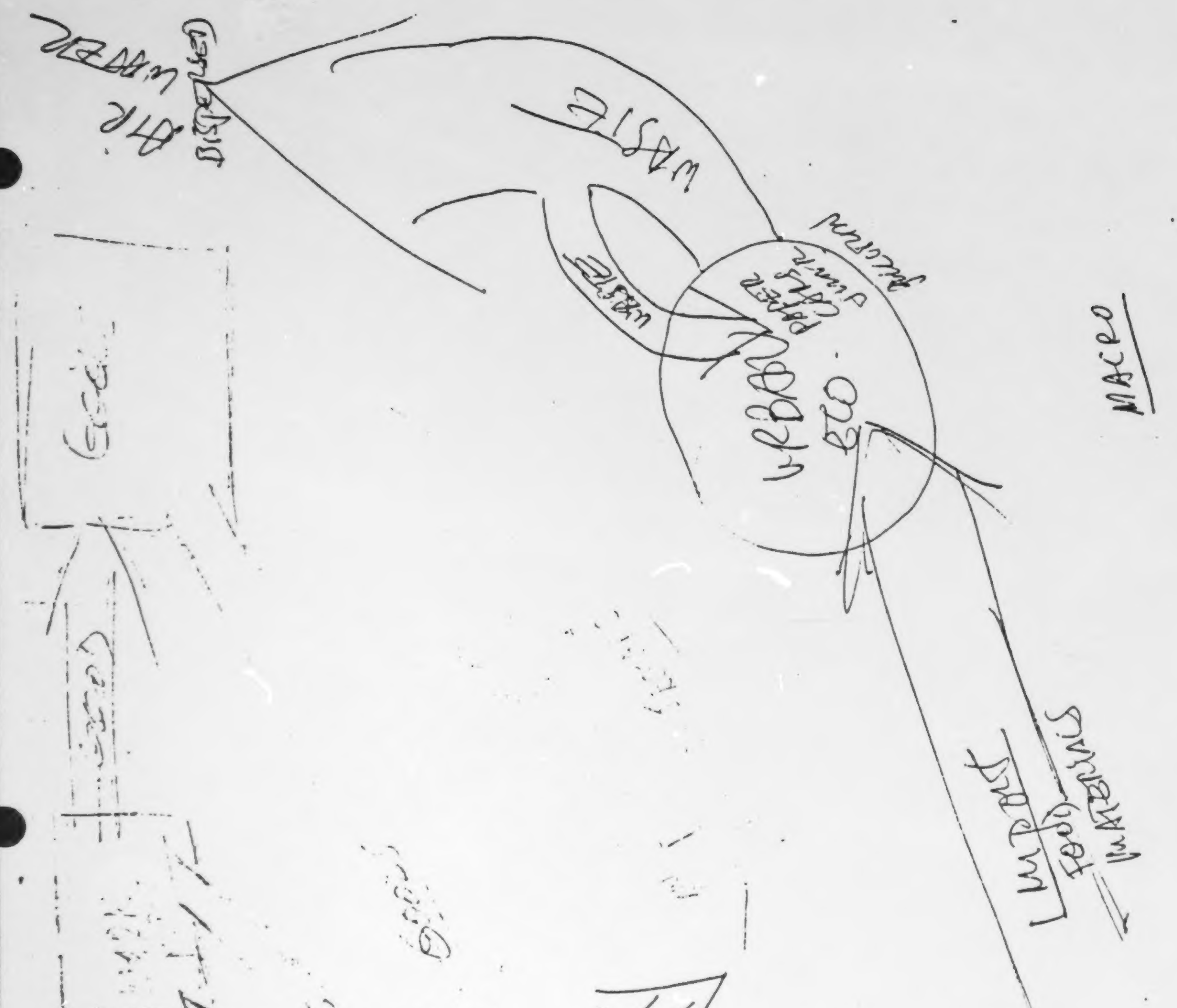
Physical env. – Perceived env. psycholog.

'lifespace' Lewin

Major Class of Variables in Study [illegible]

[illegible] (– Kahl 1977)




AIR
WATER
DISPERSED
WASTE
WASTE
URBAN ECO
PAPER
CANS
IMPORT
FOOD
MATERIALS
MACRO
WASTE
VIRUS
GOODS
Resultants-
Disease
noise
isolation
perceptions
civic
attitudes
MICRO

ACTIVITY II-I-A-1

Dispersion

Introduction:

When you were a youngster, you may have played a game called "Follow-the-Dots". The object of the game was to create a picture by connecting points in sequential order. Scientists also create pictures by connecting points to help them in their studies of the environment. The prefix "iso" is used to indicate points of equal quantity:

isotherms are lines drawn to connect points

of equal temperature

iso bars are lines drawn to connect points

of equal barometric pressure

Air temperature and air pressure are two important factors involved in determining the degree of air pollution in an environment. High pressure systems generally eliminate wind which in turn leads to a poor dispersal of contaminants. Temperature determines whether or not air will rise--and how high. (The higher the air rises, the greater the dispersal of the air's contaminants.) If the air is unable to rise, a "stable" atmospheric condition will develop in which the air will become stagnant.

Three maps accompany this activity, as well as two charts. Map #1 shows the yearly averages of sulfur dioxide (a gas) and Map #2 shows dustfall (particulate matter) for 41 air pollution monitoring stations in New York City. The third map is to be used as an aide to identifying the names and locations of the 41 stations.

On the first two maps you will note isolines (represented here as dashes) which connect points of equal concentration of pollutants.

Map #1 shows the average concentration (in parts per million - ppm) of sulfur dioxide (SO_2) at each of the 41 stations for the fiscal year July 1974-June 1975. Isolines have been drawn on the map for concentrations of SO_2 for .02 and .01 ppm.

A. Find concentrations of .03 ppm and/or higher. Isolate these values by drawing an isoline where you would expect to find concentrations of exactly .03 ppm of SO_2.

(continued)

B. Where are the highest concentrations of SO_2 located?

C. What factors could account for the patterns of distribution of SO_2 in New York City?

D. What could account for such high concentrations of SO_2 beyond the area of the .03 ppm isoline? (With a little bit of research.)

(continued)

Look at Map #2. This map also has isolines. These lines show constant concentrations of dustfall for 0.4 mg/cm^2, 0.6 mg/cm^2, and 0.8 mg/cm^2.

A. Locate stations with average dustfall 1.0 mg/cm^2 and draw an isoline for 1.0 mg/cm^2.

B. What stations are included in this area?

C. The map gives an explanation for these two stations having such high values. The chart which goes with the map states that the "Laboratory's" average dustfall was not counted in the borough summary "due to local construction". How could local construction have contributed so much to the dustfall of the environment? (Indicate possible sources of particulate matter from construction sites.)

D. What are some possible reasons why the information for Bowery Bay was included in the borough summary while the Laboratory data was not.

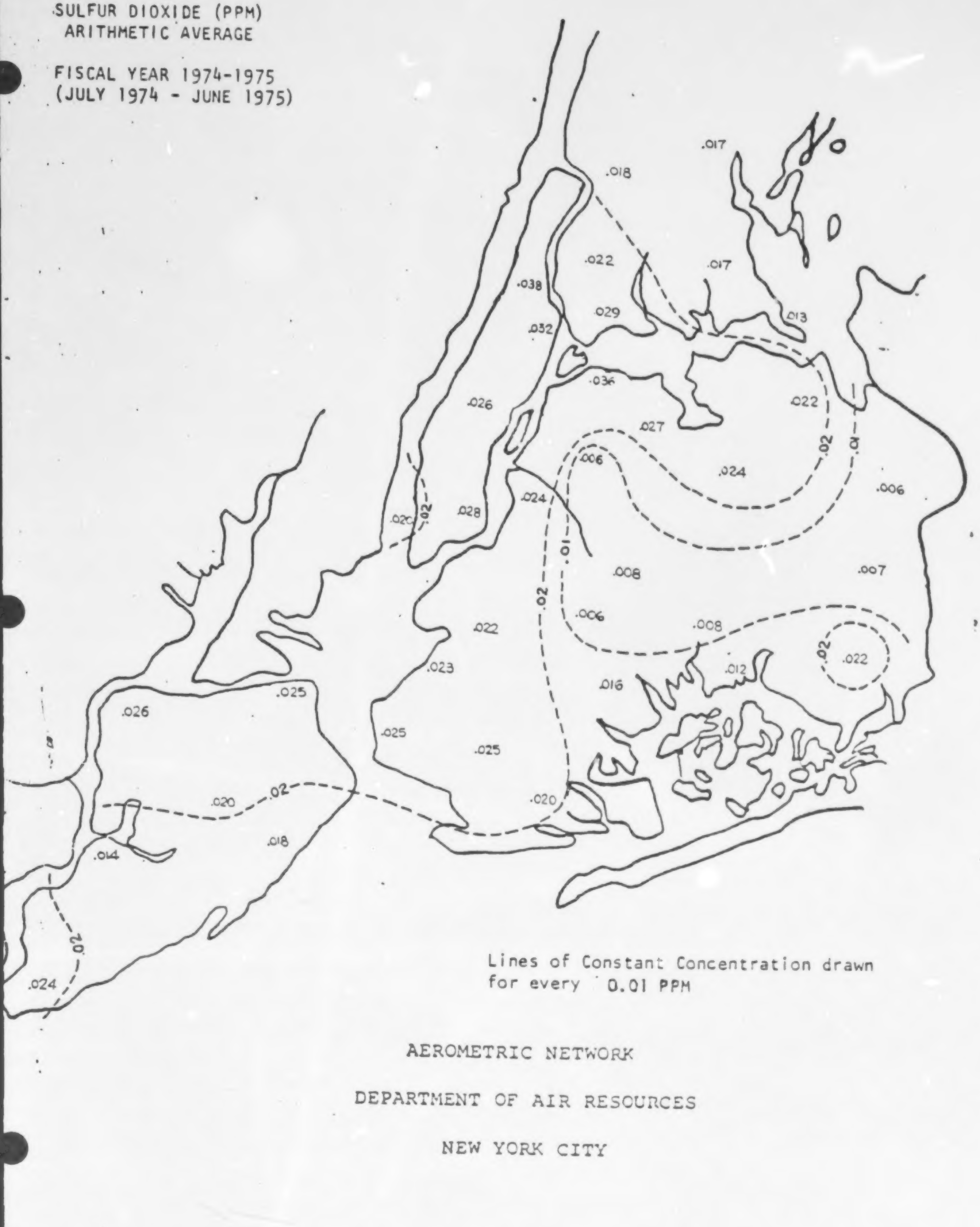
(continued)

E. What information would you need in order to determine the sources of air pollution for the other sites?

MAP #1

SULFUR DIOXIDE (PPM)
ARITHMETIC AVERAGE

FISCAL YEAR 1974-1975
(JULY 1974 - JUNE 1975)



Lines of Constant Concentration drawn for every 0.01 PPM

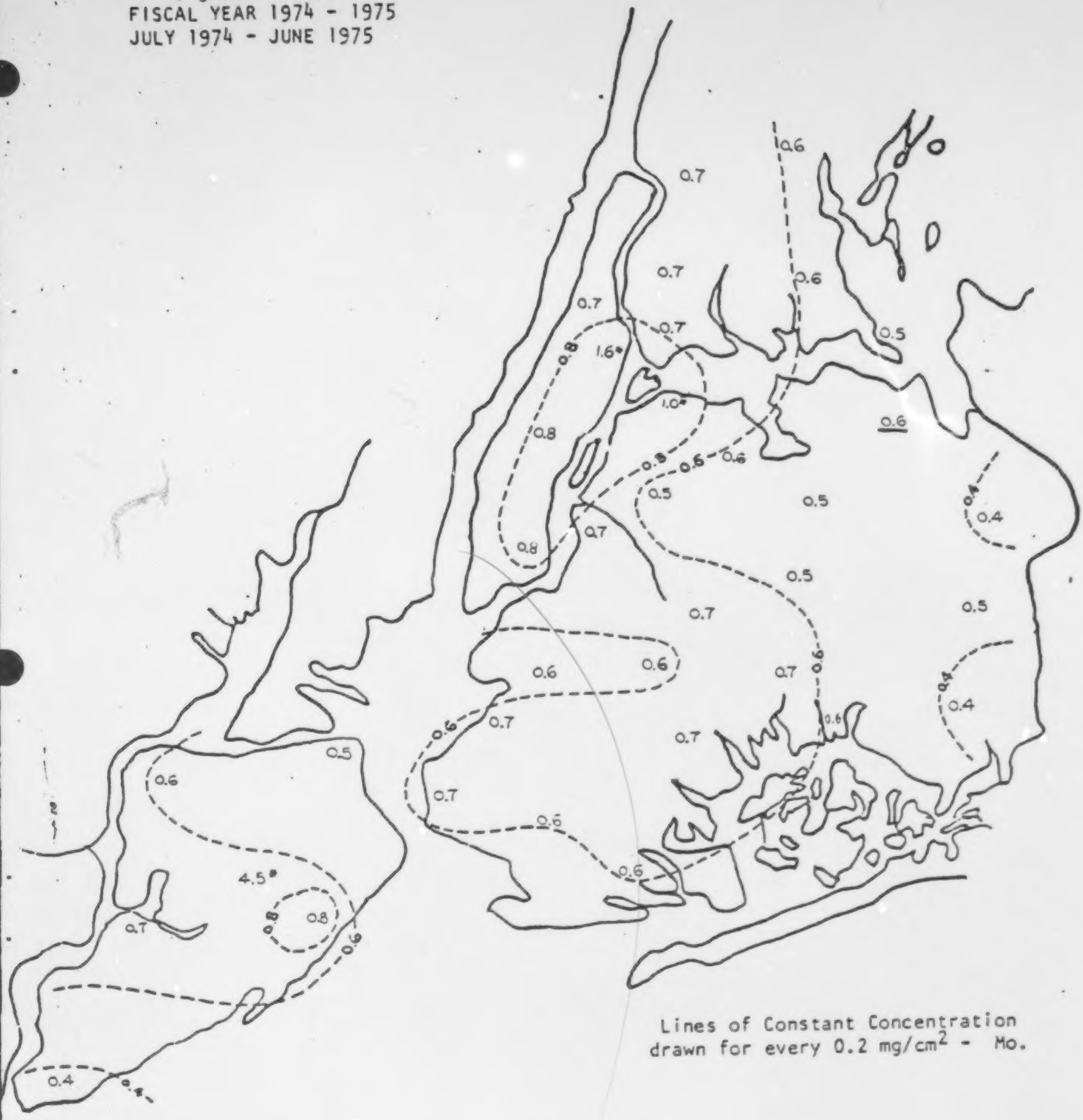
AEROMETRIC NETWORK

DEPARTMENT OF AIR RESOURCES

NEW YORK CITY

MAP #2

SETTLEABLE PARTICULATE MATTER (DUSTFALL)
(mg/cm^2 - Mo.)
FISCAL YEAR 1974 - 1975
JULY 1974 - JUNE 1975



Lines of Constant Concentration drawn for every 0.2 mg/cm^2 - Mo.

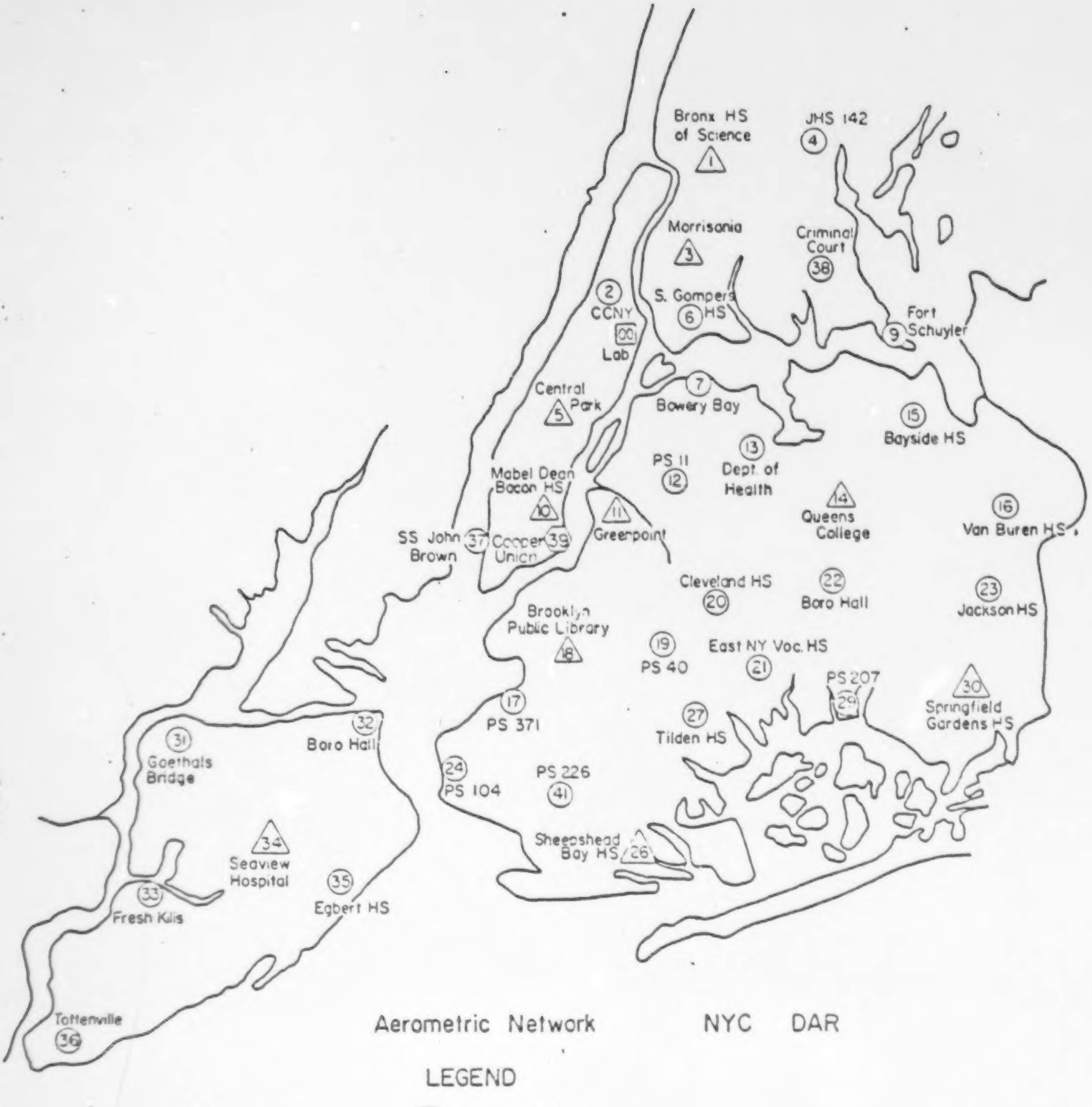
AEROMETRIC NETWORK

DEPARTMENT OF AIR RESOURCES

NEW YORK CITY

* DUE TO A LOCAL SOURCE, UNDERLINED VALUE IS A 7-MONTH AVERAGE

MAP #3



Aerometric Network NYC DAR

LEGEND

○ Manual Station
△ Telemetry Station
□ Uptown Station - 170 E. 121st Street
⬡ Command Station

CITY OF NEW YORK DEPARTMENT OF AIR RESOURCES
SULFUR DIOXIDE PPM HOURLY READINGS
FISCAL YEAR 1974-1975 (July 1974 - June 1975)

BOROUGH OR STATION	NUMBER OF READINGS		ARITHMETIC AVERAGE		PEAK READING		DAILY					
							NUMBER OF AVERAGES		NUMBER > .140		PEAK	
	73-74	74-75	73-74	74-75	73-74	74-75	73-74	74-75	73-74	74-75	73-74	74-75
ITY WIDE	133280	124539	.023	.021	.42	.39	3569	3323	2	0	.16	.12
ONX	23103	24953	.021	.019	.25	.21	631	679	0	0	.11	.10
OOKLYN	28040	27650	.022	.019	.29	.16	715	695	0	0	.11	.08
ANHATTAN	23667	22745	.031	.029	.42	.20	736	706	2	0	.16	.12
JEENS	34343	30575	.019	.017	.37	.20	860	762	0	0	.13	.09
CHMOND	24127	18616	.022	.021	.33	.39	627	481	0	0	.09	.08
ANHATTAN	23667	22745	.031	.029	.42	.20	736	706	2	0	.16	.12
-Laboratory	8737	7509	.032	.032	.33	.17	363	310	1	0	.16	.12
City College	4291	3947	.040	.038	.42	.16	112	106	1	0	.14	.12
Central Park Arsenal	3915	4171	.026	.026	.37	.20	100	109	0	0	.09	.09
-M.D. Bacon HS	3671	3547	.034	.028	.23	.12	94	85	0	0	.09	.06
-SS John Brown	3053	3569	.021	.020	.14	.11	67	96	0	0	.06	.05

CHART I

SETTLEABLE PARTICULATE MATTER (DUSTFALL) (mg/cm^2/month)

FISCAL YEAR, 1974-1975 (JULY, 1974 - JUNE 1975)

BOROUGH OR STATION	AVERAGE		MONTHLY PEAK	
	73-74	74-75	73-74	74-75
QUEENS	0.55	0.52	1.30	2.08
7-Bowery Bay *	0.75	1.00	1.71	1.78
12-PS 11	0.52	0.52	0.83	1.10
13-Dept. of Health Junction Blvd.	0.68	0.57	1.08	1.00
14-Queens College	0.55	0.49	0.85	0.70
15-Bayside HS +	0.59	0.62	1.30	1.01
16-Van Buren HS	0.41	0.41	0.66	0.83
20-G. Cleveland HS	0.70	0.74	1.04	2.08
22- Queensbough Hall	0.52	0.47	0.90	1.00
23-A. Jackson HS	0.53	0.53	0.87	0.93
29 - PS 207	0.50	0.57	0.69	1.04
30 - Springfield Gardens	0.47	0.36	0.67	0.54
MANHATTAN	0.83	0.75	1.48	1.61
00-Laboratory *	1.48	1.58	2.89	3.15
2-City College	0.77	0.66	1.48	1.20
5-Central Park Arsenal	0.82	0.76	1.29	1.41
10-M.D. Bacon HS	0.90	0.84	1.32	1.61

* OMITTED FROM BOROUGH SUMMARY DUE TO LOCAL CONSTRUCTION

+ OMITTED FROM BOROUGH SUMMARY DUE TO INSUFFICIENT NUMBER OF OBSERVATIONS

ACTIVITY II-I-A-3

Heat Islands

Introduction:

Diseases and health conditions related to temperature include: respiratory conditions, rheumatic diseases, skin cancer, malignant melanoma, cardiovascular diseases, irritability, depression, headache, dizziness, hemorrhage, venous insufficiency, embolism, hypertension. The city produces a "heat island" because the buildings, asphalt, concrete absorb the heat of the day and radiate heat at night.

This activity explores the effects of the heat island phenomenon on mortality.

I. Look at Figure 1 - "Weekly Death Rate, All Causes in New York City", from Schuman. Answer the following questions:

A. When is the greatest rise in reported death rate per 1,000 population?

B. What is the probable cause of this rise?

C. When is the 2nd greatest rise in reported death rate per 1,000 population?

D. What is the probable cause of this rise?

E. When is the lowest expected death rate per 1,000 population?

F. What, in general, is the effect of heat waves on death rate?

G. What, in general, is the effect of average temperature on death rate?

II. Look at Figure 2 - "Daily deaths, selected causes in New York City, July 2-15, 1966". CVA = cardiovascular accidents --ASHD = arteriosclerotic heart disease

A. What is the day and time of maximum temperature in Central Park?

B. At that time (in #A), what is the number of deaths due to ASHD?

CVA? Homicide? Suicide?

(continued)

C. What is the effect of temperature on the 4 death causes as reported on these graphs?

III. A. Using Table 1, "Temperatures by Day. New York-New Jersey Area, July 1-7, 1966", Buechley et al, DRAW A GRAPH.

B. Superimpose on A a graph using the data in Table 2, "Number of Deaths by Day, New York-New Jersey Area, July 1-7, 1966".

C. Compare daily highs with number of deaths for the 18 places listed.

(continued)

IV. Look at Figures 3 and 4 and 5, "New York-New Jersey Area, July 4, 1966". Describe the 18 areas as "urban" or "suburban".

A. Draw isotherms of 2° difference on Figures 3 and 4 and isolines of a difference of 10 in the mortality ratios for Figure 5.

B. Where is the greatest heat island effect located?

C. What is the temperature difference between New York City and the suburban area, by degrees?

(continued)

V. Make a phone survey of your city and the surrounding area as to temperatures. Record all of the data. Repeat #IV with the data you collect.

Figure 1

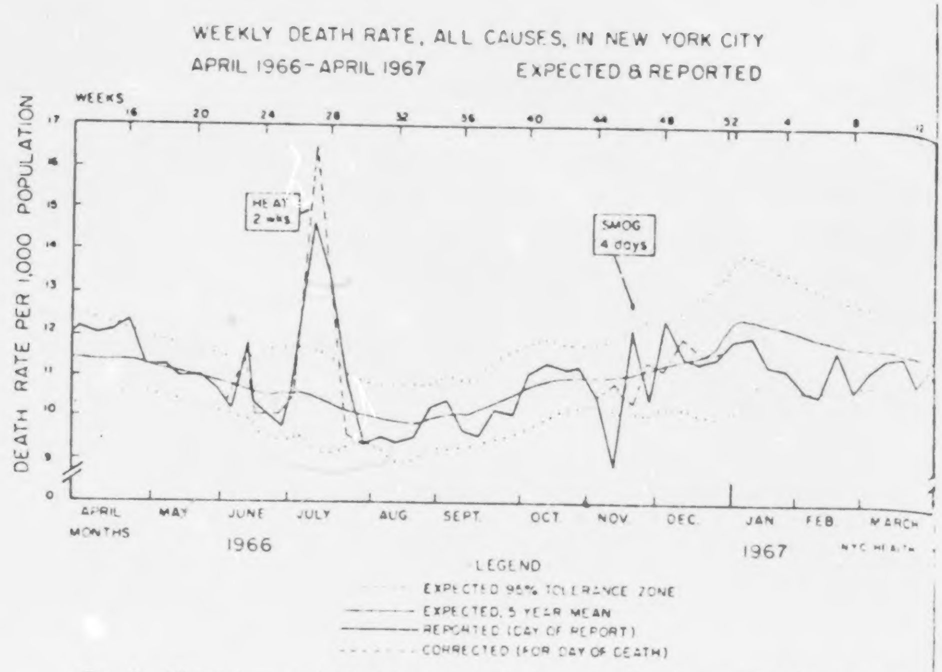
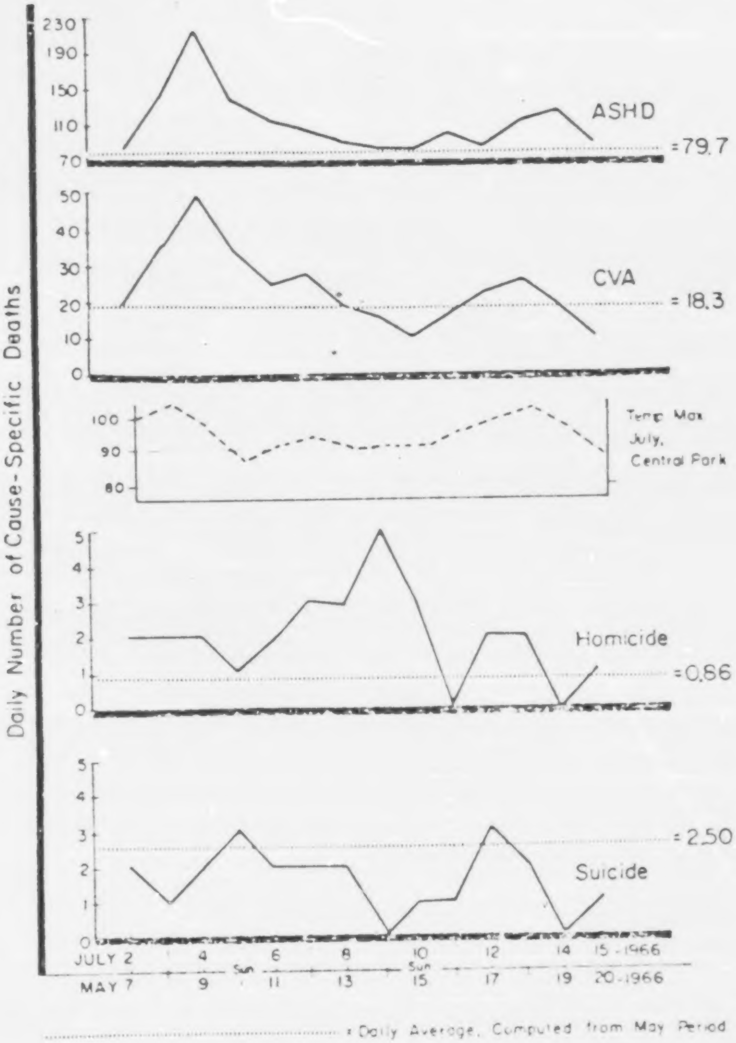


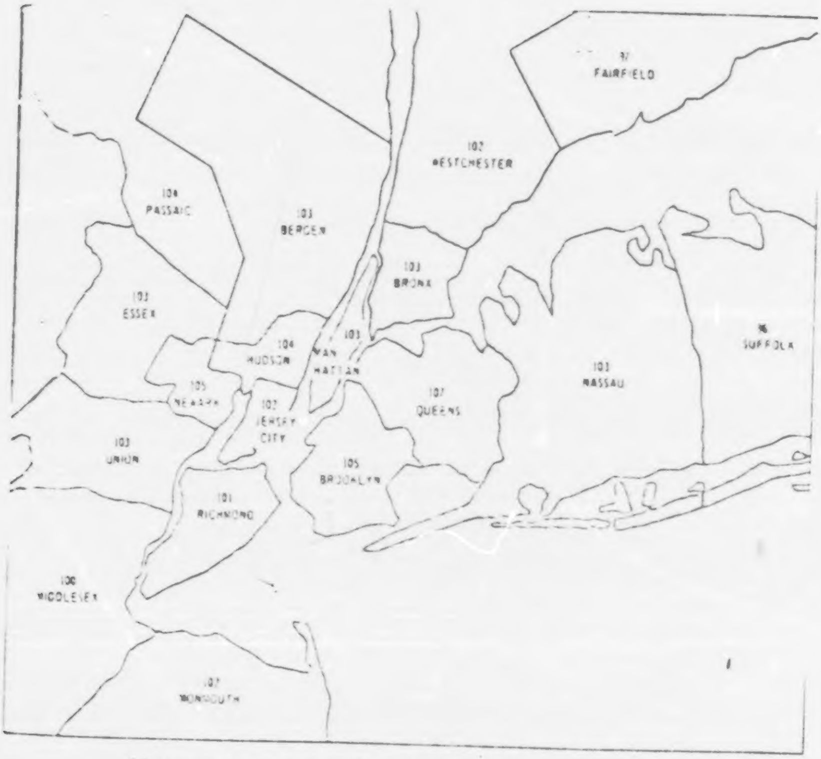
FIG. 1. Fluctuations in death rate in New York associated with episodes of heat (July 2-15) and smog (November 23-26) in 1966, illustrating the method of excess mortality. (Source of data: New York City Health Department.)

Figure 2



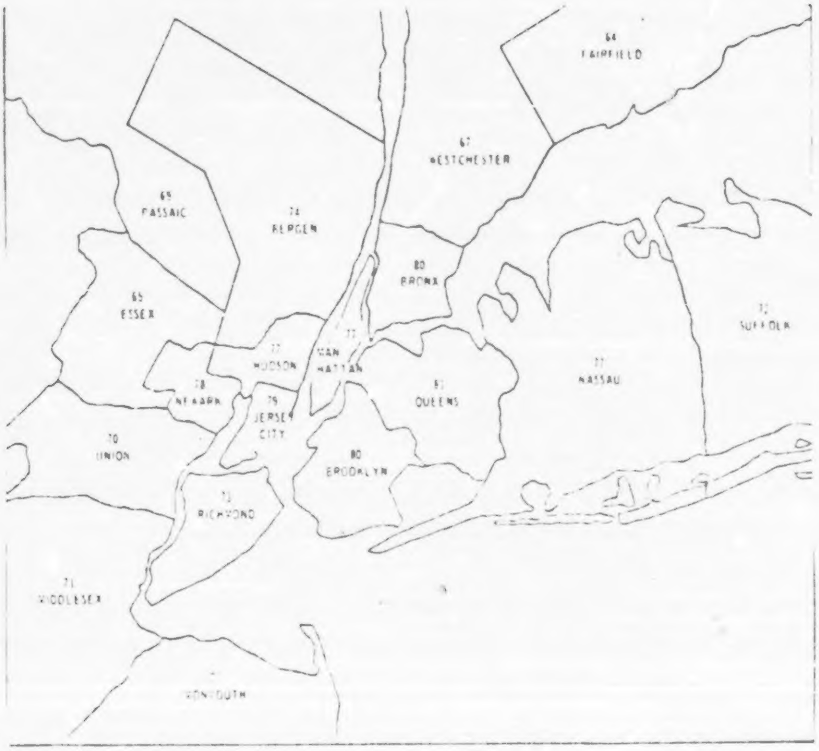
Daily deaths, selected causes in New York, July 2–15, 1966.

Figure 3



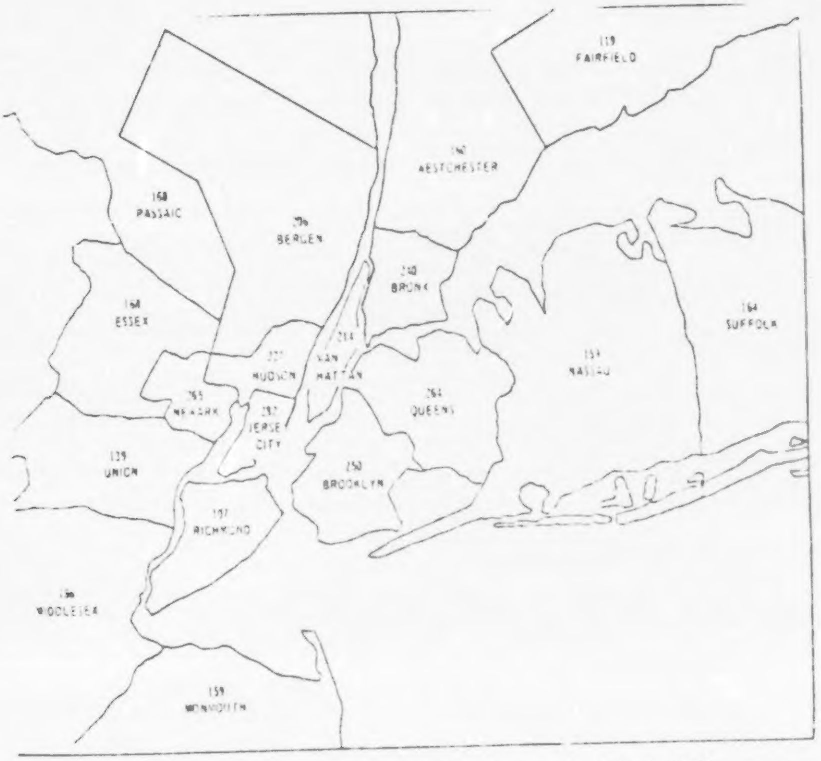
Maximum temperatures, New York–New Jersey area, July 3, 1966

Figure 4



Minimum temperatures, New York–New Jersey area, July 4, 1966

Figure 5



Mortality ratios, New York-New Jersey area, July 4, 1966

TABLE 1

Temperatures by Day, New York New Jersey Area, July 1-7, 1966

Area (City, County or Borough) Weather Station Name		Day 1	2	3	4	5	6	7
Middlesex	High	88	97	100	100	94	88	91
New Brunswick Ex. Sta.	Low	62	61	70	71	72	69	72
Monmouth	High	86	97	102	100	83	87	90
Freehold	Low	61	62	70	72	71	72	67
Passaic	High	93	94	102	104	98	91	91
Little Falls	Low	60	64	68	69	71	69	72
Bergen*	High	90	98	103	102	93	89	92
Avg. Newark AP-L.F.	Low	65	68	72	74	73	71	74
Essex ex Nwk.	High	93	95	100	103	96	87	88
Essex Falls	Low	58	65	60	65	68	73	70
Newark	High	87	102	105	100	87	87	93
Newark AP	Low	71	70	75	78	74	73	76
Hudson ex J.C.*	High	87	101	104	99	88	89	93
Avg. Nwk. AP-C.P.	Low	72	71	76	77	73	72	75
Jersey City	High	84	98	102	98	88	81	91
Jersey City	Low	67	70	77	79	72	72	74
Union	High	87	98	103	99	89	87	91
Elizabeth	Low	64	64	70	70	73	70	72
Fairfield, Conn.	High	86	96	98	93	85	82	89
Stamford	Low	57	57	64	64	65	65	71
Suffolk	High	79	91	94	90	83	78	80
Bridgehampton	Low	63	64	68	73	65	68	70
Westchester	High	90	99	102	101	87	89	91
Scarsdale	Low	57	61	65	67	67	68	70
Nassau	High	86	98	103	98	87	85	99
Mineola	Low	67	69	76	77	71	71	74
Bronx*	High	86	100	103	99	89	89	93
Avg. LaG.-C.P.	Low	72	73	79	80	74	72	76
Manhattan	High	87	100	103	98	88	91	93
Central Park	Low	73	72	76	77	71	71	74
Queens	High	86	101	107	99	90	87	94
LaGuardia	Low	72	75	81	81	76	73	78
Richmond	High	85	97	101	99	86	87	94
Westerleigh	Low	67	66	71	73	71	69	73
Brooklyn	High	85	101	105	99	87	85	93
Avenue V	Low	72	70	79	80	74	73	73

* Certain areas have no temperature recording station. Their highs and lows have been estimated as indicated.

TABLE 2

NUMBER OF DEATHS BY DAY, NEW YORK-NEW JERSEY AREA, JULY 1-7, 1966*

Place	July date 1	2	3	4	5	6	7	Daily expected
Middlesex Co., NJ	9	15	14	21	6	12	8	11.2
Monmouth Co., NJ	16	11	7	18	15	13	12	11.3
Passaic Co., NJ	10	6	17	22	23	14	19	13.0
Bergen Co., NJ	20	18	39	42	20	22	20	20.3
Essex Co., NJ ex Newark	14	13	25	28	19	24	19	16.6
Newark	12	19	21	38	13	21	17	14.3
Hudson Co., NJ ex Jersey City	4	13	16	26	13	17	10	11.4
Jersey City	8	14	12	29	26	11	7	10.2
Union Co., NJ	10	9	23	20	13	21	10	14.3
Fairfield Co., Conn.	16	27	24	23	23	20	27	19.2
Suffolk Co., NY	33	21	33	33	22	22	23	20.9
Westchester Co., NY	17	27	37	38	22	26	17	23.6
Nassau Co., NY	31	29	49	49	31	32	29	30.8
Bronx Boro, NYC	54	55	80	112	79	38	57	46.6
Manhattan Boro, NYC	69	66	88	145	99	86	76	67.6
Queens Boro, NYC	52	54	99	154	101	70	61	58.2
Richmond Boro, NYC	10	3	14	8	7	8	11	7.4
Brooklyn Boro, NYC	72	86	131	214	180	107	101	85.3
	457	486	729	1020	686	556	525	481.3

* Source: Records of the National Center for Health Statistics.
Expected numbers were computed from 1966 annual totals for each subarea and a generalized annual cycle for the U. S.

ACTIVITY II-I-B-1

Industry

Introduction:

Ever since the industrial revolution, industrial plants have been associated with rivers and lakes. The idea was that the waste products of industrial processes could be dumped into the water where it was dispersed. This seemed like a good idea, until dead fish started washing up on the shore, until the waters let off a terrible smell, until algae covered the surface, until rivers burst into flames. A lot of industrial pollution does not cause such obvious results, however.

Read: "For the Hudson, Bad News and Good", by Peter Hellman, from the New York Times, October 24, 1976- Do the following activity.

I. Look at Figure 1. PCB Levels In Fresh Water

A. How do PCB's get into the water?

What industries are the major contributors?

B. Why are PCB's considered a problem?

C. Which lake or lake group has the most PCB pollution?

At what level ppm (parts per million)?

D. Does the problem seem to be getting better or worse, over the 3 years the samples were taken?

(continued)

E. If PCB's are no longer dumped into the water, will the water again become PCB free?

Why, or, why not?

II. Look at Figure 2. PCB Residues in Lake Michigan Fish, 1972-74

A. Which fish has the highest PCB level?

What is that level?

B. Which fish showed a more or less constant level of PCB's over the 3 years?

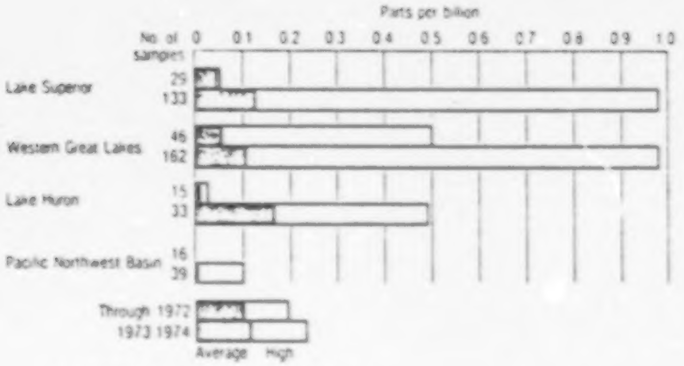
C. How do these levels compare with Hudson River fish?

D. How do PCB's accumulate in the food chain?

E. Why are high PCB rates in fish especially important to humans?

Figure 1

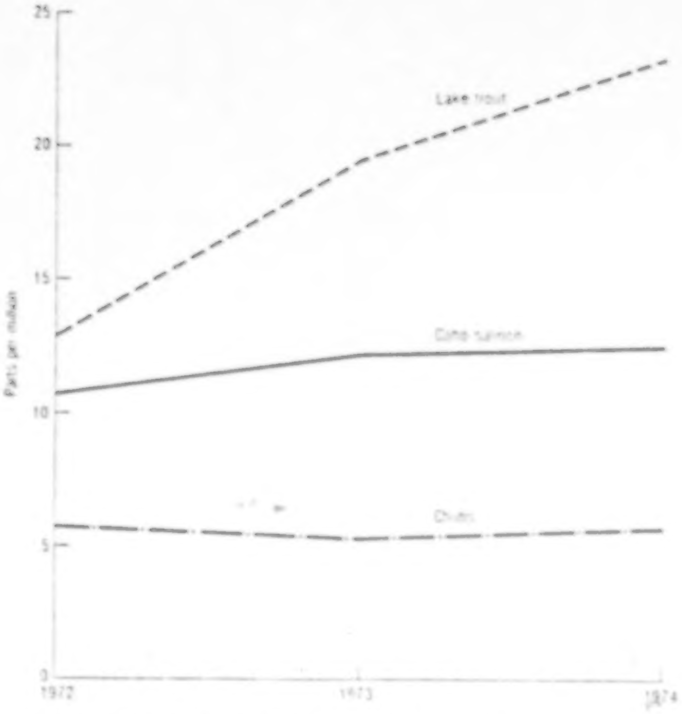
PCB Levels in Fresh Water



Source: Environmental Protection Agency, STORET

Figure 2

PCB Residues in Lake Michigan Fish, 1972-74



Source: [illegible] Contaminants in Great Lakes Fish, Michigan Department of Natural Resources staff report, June 1975, p. 15.

FOR THE HUDSON, BAD NEWS AND GOOD

The bad news:

PCB's don't smell or turn fish belly up. But they can make people sick—and they lie in heavy concentrations at the bottom of the great river.

By Peter Hellman

Peter Hellman, a freelance writer, often has fished the Hudson River.

Luke Hart, manager of the two General Electric capacitor factories at Hudson Falls and Fort Edward, N.Y., holds up a small vial filled with a brilliantly clear, slightly viscous liquid.

"This is the stuff that's caused all the fuss," he says. "This is PCB's."

PCB's is short for polychlorinated biphenyls, a nearly indestructible and highly dangerous group of industrial compounds that for many years seemed to be responsible for nothing but good works. The very recent "fuss" has comprised a succession of unprecedented events. First came the banning of almost all commercial fishing on the Hudson River. Then came a $4-million settlement by the polluter, G.E. And now that G.E. has all but stopped discharging PCB's into the river comes the most difficult and dangerous problem of all: What to do about some 500,000 pounds of the stuff that still reside menacingly on the river bottom?

In his big, drab office at the Hudson Falls plant, Hart demonstrates for his visitor and a watchful G.E. corporate lawyer the positive side of PCB's. He plugs in an electric motor with an ammeter on its face. He pushes one button and the needle jumps to 400 amps. He pushes another button and the needle drops back to 200 amps. But the motor continues to hum at full power, even though it is drawing half as much current. The difference, Hart explains, is that the second button has cut-in capacitors—devices that store and smooth out electric current so that it is more efficient. Capacitors are used in everything from toasters to huge generators, helping save untold millions of dollars on everyone's electric bills. Yet, in its basic form, the capacitor consists of nothing more than layers of

Continued

a metal like aluminum foil, which is a conductor of current, separated by paper, which is not a conductor. Such a nonconductor is called a dielectric, and the best capacitor of all is one in which the paper dielectric is impregnated with PCB's.

At its two plants on the Hudson River, G.E. puts anywhere from a few drops to three gallons of PCB's into the tens of thousands of capacitors it makes each day. G.E. engineers, says Hart, have not found any compound equal to PCB's for high dielectric performance coupled with almost complete resistance to fire or explosion. Because PCB's are a superior heat-transfer agent as well, they are also preferred for use in transformers to carry heat away from the coils, where fire is always a threat. Sealed up in electrical systems, PCB's do their job and never misbehave.

Only in the last decade has it become obvious that PCB's are a subtle but pervasive pollutant of air, earth and water. Other such pollutants have been detected in the environment recently—most notably, the highly toxic insecticide Kepone. In fact, three weeks ago, the U. S. District Court in Richmond, Va., fined the Allied Chemical Corporation $13,375,000 for dumping Kepone into the James River. But none of them has turned up with such alarming frequency as PCB's in all kinds of living organisms, from tiny crustaceans to human beings. Just last summer, the U.S. Environmental Protection Agency found the chemical in the milk of mothers in 10 different states. The effect of PCB's is, at worst, fatal and, at best, unknown. And, thanks to G.E., nowhere is there a greater concentration of PCB's at loose in the environment than in the Hudson River below the capacitor plants at Hudson Falls and Fort Edward. Due to high levels of PCB's in resident and migratory fish all the way down to its mouth, more than 200 miles away, the Hudson has been closed since last February to most commercial fishing for the first time in its history—a time, ironically, when the river is relatively free of traditional pollutants.

It has been a year since G.E. has discharged any significant quantities of PCB's into the river. The current daily discharge is less than one pound. By next summer, G.E. will stop using PCB's altogether and substitute another substance—as yet not announced—that it believes will be effective in its capacitors and safe in the river. Even so, the company is spending several million dollars to prevent residual PCB's in pipes and the soil around the plants from leaking into the Hudson. The principal supplier of PCB's, Monsanto Company, has announced it will stop producing the compounds by the end of October 1977.

Last August, after months of negotiations, G.E. agreed to pay the State Department of Environmental Conservation $3 million to help restore the river and another $1 million for research. The state will chip in $3 million of its own for restoration. This is an agreement with many implications. By paying up, G.E. has tacitly admitted responsibility for the environmental consequences that stem from its activities. Moreover, the company has done so even though it has never been specifically prohibited from dumping PCB's into the river. In fact, until very recently, it had a permit—issued by the E.P.A. and endorsed by the state — that specifically authorized it to discharge up to 30 pounds of PCB's into the river daily. By contributing $3 million of its own toward restoration as part of the agreement, the D.E.C. has tacitly acknowledged its own failure as a watchdog.

When the state at last confronted G.E. a little more than a year ago, the situation had all the makings of a bitter and protracted court battle of the sort that Reserve Mining Company and a raft of public agencies have fought over Reserve's waste discharges into Lake Superior. The August agreement, by contrast, was accomplished by negotiation after a rigorous but comparatively swift exjudicial hearing sponsored by the D.E.C. and chaired by a law professor from Columbia University. The whole process took less than a year. And while the parties never saw the inside of a courtroom, the agreement nonetheless puts American companies on notice that they may be held responsible for what they do

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to the environment — even when they have not been specifically prohibited from doing it.

The truth is that PCB's have been around for some 45 years without producing the kind of dramatically obvious effects that might have caused G.E. or any other user to think twice about dumping them in a river. They don't smell, lie in slicks atop the water or turn fish belly up; they simply sink to the bottom. At the same time, they are extraordinarily useful to industry. Besides their use in capacitors and transformers, PCB's have proved invaluable in products as diverse as hydraulic fluid, adhesives and carbonless carbon paper. By 1960, they were being manufactured in the United States, Russia, Japan and at least six European countries.

Then, in 1964, a Swedish scientist named Sören Jensen was puzzled by the results of a sophisticated analysis he was conducting on the soil and animals of his country. He was looking for traces of DDT and related insecticides, but he found instead traces of something that did not conform to known DDT patterns. After two years of trial-and-error comparisons, Dr. Jensen finally identified the unknown substance as PCB's. At that point, of course, they were merely a novel presence, not in the same worrisome and well-publicized class with DDT. If anything seemed ominous about the discovery, it was that Dr. Jensen found PCB's in plankton and in large eagles—the bottom and top of a wildlife food chain. That, and the fact PCB's were being found in a country that did not manufacture them. The nearest manufacturer was in Germany, across the Baltic Sea. Dr. Jensen speculated—correctly—that PCB's, rising unburned from incinerators because of their low flammability, could travel long distances by attaching themselves to airborne dust particles, raindrops and snowflakes.

Four years after Jensen's discovery and on the other side of the world—at a rice-oil factory in the Fukuoka prefecture of western Japan—a machine containing PCB's sprang a leak, contaminating the rice oil. Thousands of people who used that oil for cooking became ill. The effects of what came to be known as the *Yusho*—rice-oil—syndrome included skin eruptions and darkening of the pigmentation, swollen eyelids, eye discharges, swelling and painful joints, numbness of the limbs, coughing and sputum, and general fatigue. Some victims suffered from enlarged livers and imbalanced enzyme and blood-lipid levels. Perhaps most disturbing, mothers who had been exposed only fleetingly to PCB's—and who did not necessarily show any symptoms themselves—gave birth to babies with dark pigmentation, delayed tooth development and lower-than-average weight. Even today, almost nine years after eating tiny quantities of PCB's—and long after all traces have passed from their bodies—the symptoms of many *Yusho* victims persist. Recently, a Japanese researcher told a cancer conference at Cold Spring Harbor that the incidence of liver cancer among *Yusho* patients now appears to be as high as 15 times the normal rate.

In New York, G.E. has always asserted that workers with long-term exposure to PCB's have suffered no more than occasional skin rashes. But Dr. Irving Selikoff of the Mt. Sinai Medical Center, who is now studying workers at the two plants on the Hudson, warns that to assume the problems are limited to skin rashes "would be in error."

Meanwhile, as Monsanto, sole U.S. producer of PCB's, supplied an ever-growing demand for the product all through the 1960's, mink ranchers in the Great Lakes region were having mysterious problems getting their female minks to reproduce. "These ranchers were getting wiped out," says Robert Ringer, a physiologist at Michigan State University, "and they didn't know why." Dr. Ringer suspected the trouble was the DDT in the Great Lakes fish that the mink ate. But even when he fed them fish containing unusually high levels of DDT, his laboratory mink went right on reproducing. In 1968, Dr. Ringer finally determined that the problem was not DDT but PCB's. A tiny amount—just 0.164 parts per million (p.p.m.) — stopped mink reproduction. A larger amount — 3.57 p.p.m. — killed all the adult minks. Even this last figure is well under the maximum of 5 p.p.m. that the U.S. Food and Drug Administration currently allows in food for human consumption.

Other experimental evidence was piling up. One American researcher fed PCB's to rats and produced tumors. Another, James Allen, a pathologist at the University of Wisconsin, fed PCB's to monkeys and produced the symptoms of the *Yusho* syndrome, including reproductive problems. In female monkeys that were fed PCB's at the F.D.A.'s permissible level for humans, 5 p.p.m., only one in eight gave birth to normal offspring. And once the infant monkeys began nursing, they were subject to further hazards. Since PCB's moves rapidly into fatty parts of the body, the substance became concentrated in the mother's milk. Hence, the level of PCB's present in the infants at birth subsequently increased 100 times.

As the danger flags went up, Monsanto began limiting sales in 1971 to manufacturers who used PCB's in "closed systems"—that is, in transformers and capacitors, where the substance is sealed in and not exposed.

"Open systems," by contrast, put PCB's in direct contact with the environment—paint, for example or, worse, sprays used on dirt roads to keep down dust. But even "closed systems" don't stay closed forever: Old capacitors and transformers continue to

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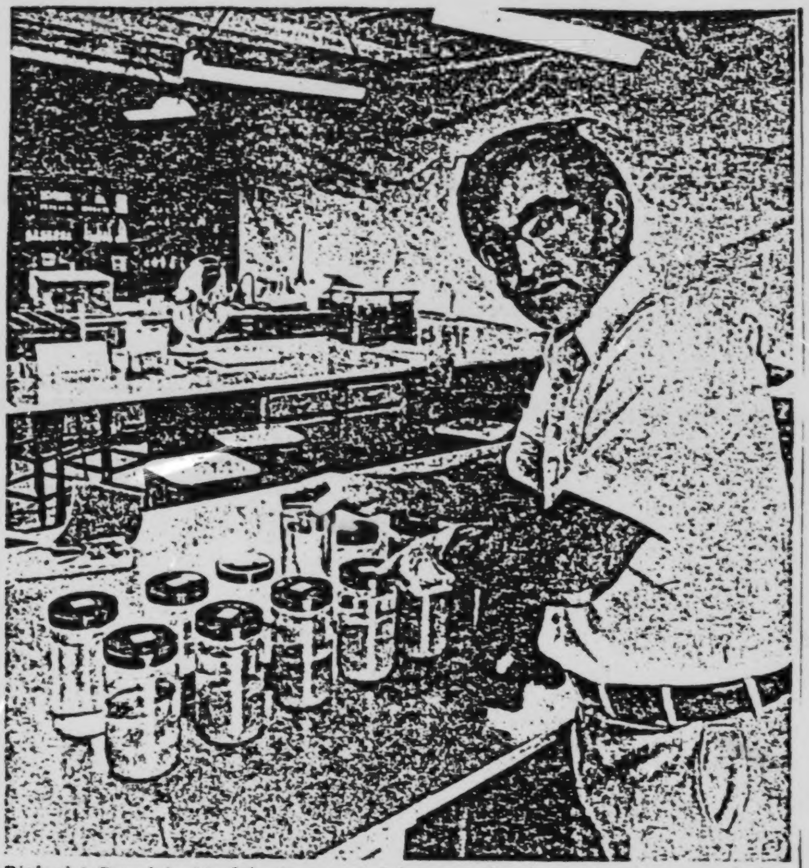

Biologist Dovel in his lab. Jars containing samples from the river reveal that Haverstraw Bay "approaches the virgin richness of an unspoiled estuarine marsh."

"These are grim figures and I certainly think the state should warn fishermen not to eat striped-bass eggs," wrote Boyle. Parker's reply, according to Boyle, was "derisive."

What the state would not do for itself was finally done, in August 1974, by Royal Nadeau and Robert Davis of the local office of the E.P.A. Disturbed, along with a few others in the agency, by reports of high PCB levels showing up around the country, they decided to check out the Hudson River, with special attention to the section below Fort Edward and Hudson Falls. This was hardly a brilliant idea, of course, since G.E. had been announcing its PCB discharges in permit applications for years. Nadeau and Davis found extraordinarily high levels of PCB's in the water, river mud and living creatures in the vicinity of the G.E. plants. Just below Fort Edward, they found what was, until then, a "world's record" for PCB-infested fish—a rock bass measuring in at 355 p.p.m. They could hardly believe it was still alive.

For a full year, the report of the two scientists floated around. It finally reached Gilman Veith, a chemist at the E.P.A.'s National Water Quality Laboratory in Duluth, Minn. Dr. Veith had first come up against PCB's as a graduate student working on the mink problem in the 1960's. Now he was watchdogging PCB's nationwide. "I was convinced after reading this report," he says, "that the Hudson River situation was the worst I'd seen in the country by at least a factor of ten." Veith wrote a review of that report, emphasizing its seriousness, and sent it off to the director of the E.P.A. regional office in New York. It was forwarded, in July of last year, to Ogden R. Reid, who had been Commissioner of the D.E.C. for just six months.

At last, things began to happen. Startled by this alert all the way from Duluth, Reid poked around his own department to see if anyone knew about the PCB problem. He was flabbergasted to discover that plenty was known, but nothing had been done. Nobody had even bothered to tell him about PCB's. Reid found that he had to develop new communication lines to insure he would get PCB memos—including those of Ward Stone. That August, Reid warned the citizenry not to eat striped bass from the Hudson or salmon from Lake Ontario, a warning he would convert into a ban in the Hudson by February. He also ordered an administrative hearing, chaired by a Columbia University law professor, Abraham Sofaer, to determine if G.E. had violated state water-quality standards and, if so, what sort of restitution the company should reasonably make.

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At those hearings, held last November, a parade of state's witnesses testified that PCB's are toxic to a wide range of living creatures, including man. It was also made strikingly clear not only how high PCB counts were downstream from the G.E. plants (78,000 p.p.m. at the Hudson Falls outflow), but how low they were just a few hundred yards upstream (practically negligible). As a result of new surveys, the record established by Nadeau and Davis with their rock bass was easily broken by many fish. The new record holder was an American eel containing 575 p.p.m. of PCB's. It would have supplied a consumer with more than half his lifetime PCB limit as set by the F.D.A. And in Canada, where the maximum PCB content of edible fish is 2.5 p.p.m. rather than 5, that single meal would have easily exceeded the lifetime safe limit.

Given such testimony, it came as quite a surprise when G.E. introduced its own expert witness, Gerald Lauer of Ecological Analysts, Inc., who presented his finding that fish taken from below the two plants did not contain PCB levels in excess of the current standard of 5 p.p.m. Upon cross-examination, Lauer had trouble deciphering his own notes and tables. It turned out, furthermore, that the laboratory in Tennessee that had made the analysis had botched the job. G.E. withdrew Lauer's testimony.

G.E. did better with its basic "affirmative defense," which held that it had applied for and been granted both state and Federal permits to discharge PCB's. How could it be penalized for scrupulously following the law? Sofaer agreed that this argument had "more than superficial appeal." But it was not enough to excuse G.E. from the general requirements of its permit, which forbade the company to violate state water-quality standards even if the precise prohibitions were not spelled out. Accordingly, Sofaer ruled that "G.E. has discharged PCB's in quantities that have breached applicable standards of water quality . . . injured fish, and . . . destroyed the viability of recreational fishing in various parts of the Hudson River by rendering its fish dangerous to consume."

It came out during the hearings, most interestingly, that even before the PCB problem became public, G.E. already had determined that further significant discharges could be eliminated without much difficulty. PCB's entered the river primarily via waste waters used to wash off the casings of capacitors that had been submerged in a PCB bath. This water could easily be contained and the PCB's destroyed by ultra-high-temperature incineration.

G.E. was not the only party to lose out. Just four months after Sofaer's decision was announced, Ogden Reid found his position untenable and resigned after a year and a half as Commissioner of the D.E.C. Several things had gone wrong, but the main one was that he had picked an inopportune time to go after G.E.—the middle of Governor Carey's desperate campaign last winter to keep the state from being pulled down by New York City's financial collapse. Looking forward to the critical "spring borrowings," Carey was busy telling the financial community what a wonderful and hospitable place New York was to do business, while Reid played the heavy to one of the state's top corporate citizens. At one tense meeting with Carey and Reid, the G.E. board chairman, Reginald Jones, is reported to have angrily warned that he would pull all company facilities out of New York if Reid forced the two Hudson River plants to go to zero-PCB discharge before G.E. thought it feasible.

Publicly, Carey never backed off from defending Reid on the G.E. issue. But neither did he stop a vigorous frontal attack by Reid's fellow commissioner, John Dyson of the State Department of Commerce. "If zero discharge means zero jobs and three ounces means 1,200 jobs, I say we go for three ounces," said Dyson, in one of his many utterances.

Reid's downfall was hastened, no doubt, by a manner that struck many upper-level departmental bureaucrats as being peremptory and insensitive to the pecking order. As the end approached last winter, three of those bureaucrats resigned together in protest of Reid's leadership. Reid even had the Albany press sniping at him over departmental "morale" right up to the day of his resignation. At press conferences, certainly, Reid did not have Carey's light touch and fancy footwork in fending off sticky questions. At a sensitive time for the state in its relations with industry, Reid carried a big stick but walked loudly.

Though Reid is gone, replaced by Peter A. A. Berle, and G.E.'s PCB discharges are all but ended, a momentous problem remains: the estimated 500,000 pounds of PCB's on the river bottom downstream from the plants. The state has roughly $6.4 million with which to attack the problem—about $3.4 million of it from the settlement with G.E. (The rest of the G.E. money will be spent on studies of other chemicals in the Hudson, including the one G.E. plans to use in place of PCB's.) The first step, which will cost about $1 million and take six months, is to find out what can be done. This will consist mainly of mapping the precise locations and depths

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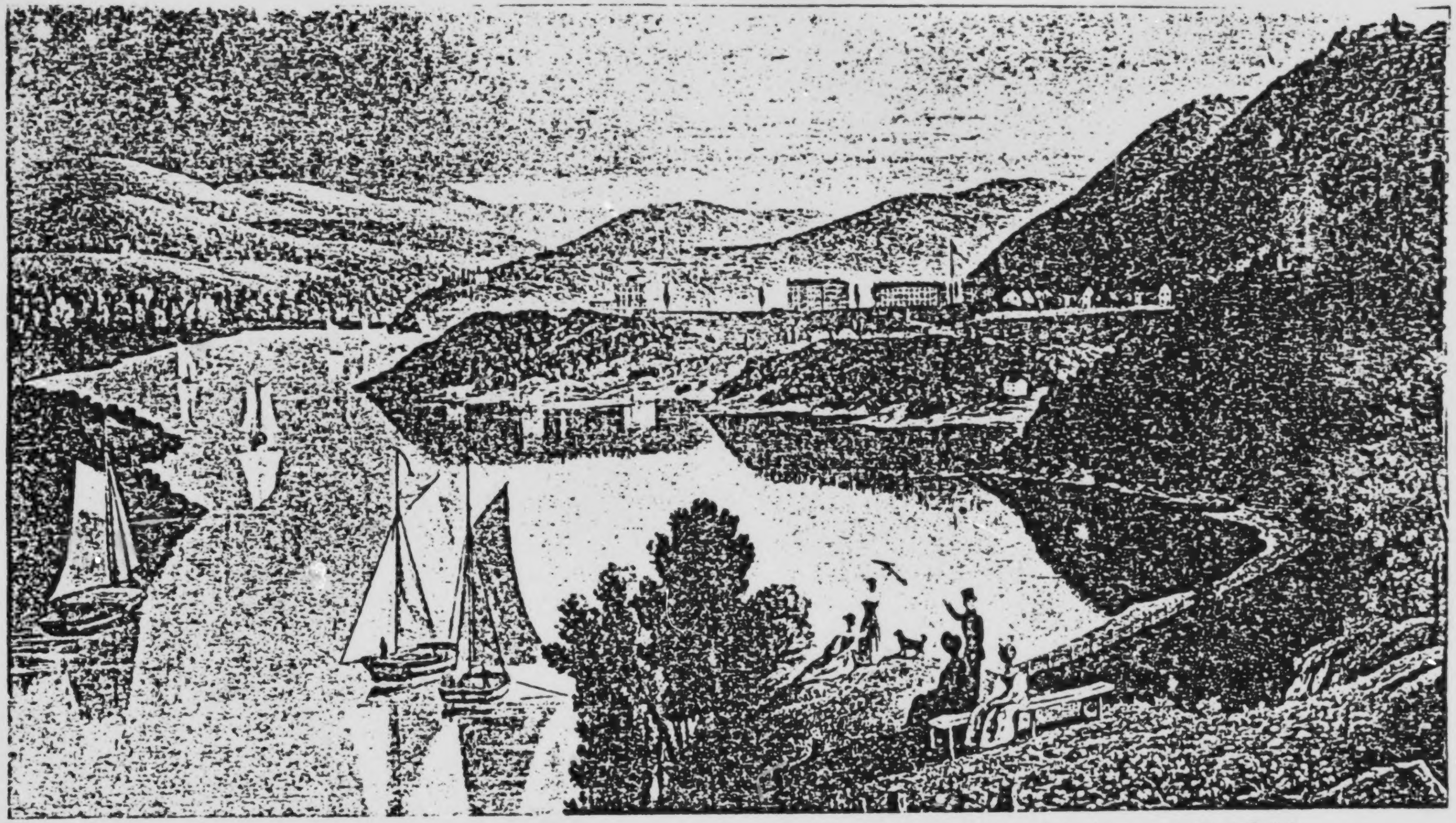
of the PCB's, which now appear to be concentrated behind the eight dams on the river between Hudson Falls and Troy.

The next step will be to attempt to render the PCB's harmless. How this might be accomplished is not yet clear, though it is certain to take years. The most obvious approach—dredging up the PCB muck—presents several problems. For one thing, the task might require expensive, specially designed dredges. Moreover, no riverside locality is likely to welcome huge mounds of PCB muck in its backyard. One possible solution, which Philip Gitlen, the D.E.C. counsel, admits is now "esoteric," would be to neutralize the substance through a complex method recently developed by a Canadian biochemist. The method uses sound waves to break up the oily chemicals and a specially developed strain of bacteria to devour them. It has worked in the laboratory, but no one knows when it will be perfected for large-scale use.

Dredging entails yet another complication: Like stirring up dust in a closed room, it might send dormant PCB's flowing into the water currents, renewing the danger to living creatures. For this reason, says Gitlen, another approach might be "to do nothing." The trouble is that, unlike dust in a closed room, PCB's don't necessarily lie dormant. In the 12 days of heaviest river flow each year, according to D.E.C. tests, as many as 10,000 pounds of PCB's may pass over the Troy dam. They will then head, unimpeded, toward the rich estuary of Haverstraw Bay, where they can do far more harm than in the already unhealthy and unproductive stretch above the Troy dam.

Even if at least some dredging is undertaken—as now appears likely—it may be three years before PCB's are actually scooped out of the river in quantity.

On an ageless schedule each spring, in the meanwhile, unbeknown to most people who live along the Hudson shores, fragile alewives and blue-back herring will turn the corner from the sea in March and head up the river—past the Battery, past the West Side Highway, up the ever-widening flow to the Tappan Zee and Haverstraw Bay and even up into the narrowing of the Highlands. They will swim up to spawn by the billions. Several weeks later, they will be followed by their larger cousins, the fighting shad. Then will come the swift striped bass and the ancient, lumbering sturgeon. As all these fish move upstream, they will unavoidably accumulate PCB's. And, despite the landmark agreement betwen the company and the state, nobody knows when those fish will be free of PCB's, or free enough, at least, to allow the river to be reopened to commercial fishing. And, certainly, nobody knows precisely what the eventual effects of this subtle pollutant will be. ■



The Hudson's serene majesty, unruffled by pollution controversy, in a lithograph, circa 1840. The view is downriver, past West Point.

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The good news:

Controls on other forms of pollution are paying off. In most visible ways, the Hudson has not been so healthy for decades.

The Hudson has been making remarkable progress in ridding itself of the traditional pollutants along its 315-mile length. This view is endorsed even by the people whose very livelihood depends upon the river's well-being—the 70 or so commercial fishermen who put out their nets mainly in Haverstraw Bay. Until PCB's forced a ban on most commercial fishing last February, they were making ample catches of striped bass, perch and eels.

The Hudson has benefited greatly from the state's billion-dollar "Pure Waters" bond issue, which was overwhelmingly approved by the voters in 1962. Strongly backed by Gov. Nelson Rockefeller, the bond issue has enabled the state to build new water-treatment facilities even when Federal funds were slow in coming. And if the work has not gone ahead precisely on schedule, it at least has gone ahead—in stark contrast to the state's years of foot dragging on the PCB problem.

Even when it was most abused by human and industrial wastes, however, the remarkable Hudson has always remained, with the exception of a single miserable stretch, more intensely vital than perhaps any other American river. Indeed, it hosts a far richer variety of fish life near the great metropolis at its mouth than it does near its unspoiled source at Lake Tear of the Clouds on Mount Marcy, highest mountain in the Adirondacks. Far upriver, the water runs clear, cold and fresh. But it can support only a modest population of fish, primarily trout and smallmouth bass. As the river flows down toward Corinth, it gets deeper and darker. Largemouth bass, pike and carp are most at home in this stretch, which is hardly better or worse than any other medium-sized, long-exploited river. It is only in the 50-mile stretch beginning at the doorstep of the General Electric plant at Hudson Falls that the river has been defeated abjectly. Walled, canalled, constricted and dammed, the Hudson here has been reduced to little more than a sink that must accept waste from the appallingly filthy lower Mohawk River as well as from its own banks. In summer, this portion of the Hudson can stink, and it is very hard to find any living fish here at all.

Once the flow is well clear of Albany, changes both visible and invisible occur. As low hills roll toward the distant, plum-toned Catskills to the west, the river almost miraculously rids itself of the upstream poisons. The City of Poughkeepsie actually uses this water, after treatment, for drinking. Twenty miles farther south, at Newburgh, the forested hills close in and rear up sharply over the river. This is the Highlands, and its 15 miles are the least-spoiled, most-dramatic section of the river. Here, at the jut of land called World's End, just across from the ramparts of West Point, the river plunges to its greatest depth of 216 feet. In sight of that spot, just two miles upstream, Storm King soars 1,300 feet almost straight up with the bulk and violent power that make it resemble a huge bear. There is nothing quite like the Hudson here. Other rivers cut scenically through the Appalachians, of course, but only the Hudson cuts with such a sharp, deep stroke, and only the Hudson does it without rising above sea level.

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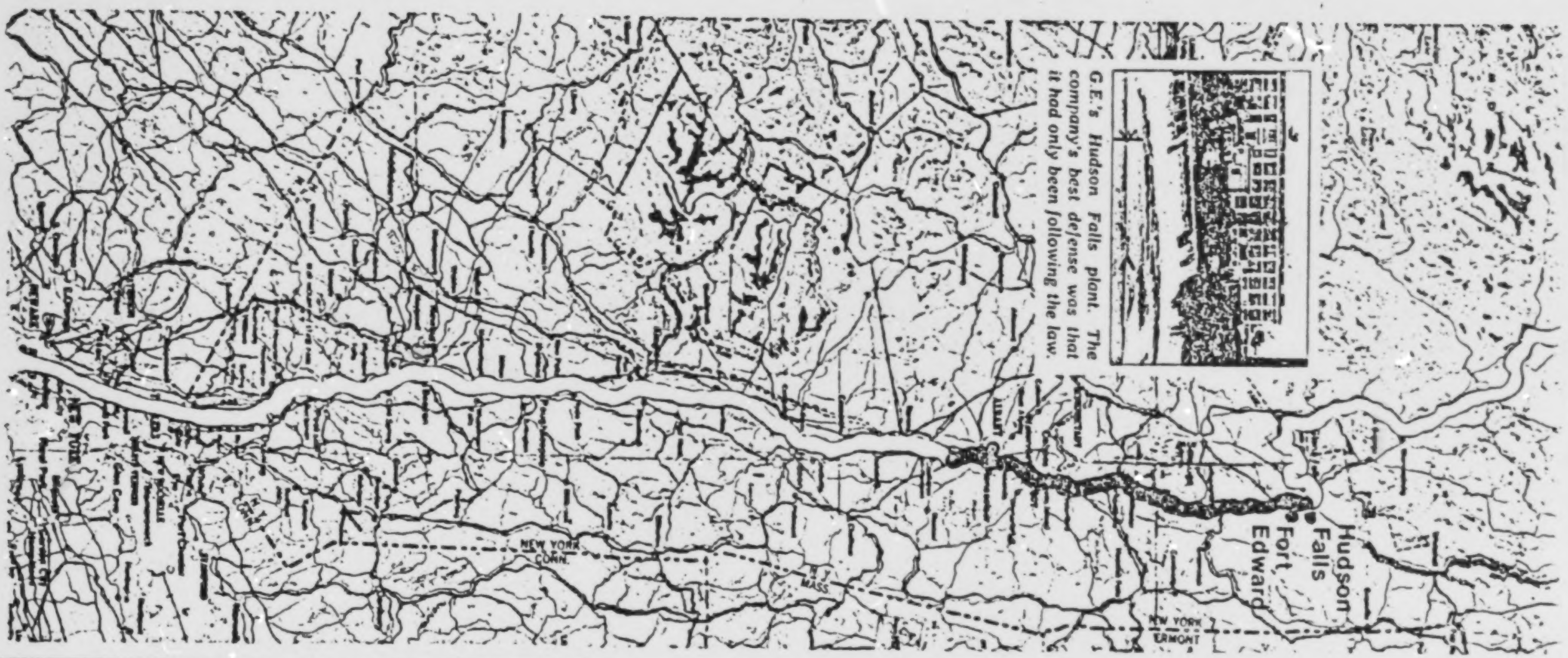

G.E.'s Hudson Falls plant. The company's best defense was that it had only been following the law.

Map traces the river's journey from the Adirondacks to the Atlantic Ocean. Area of heavy PCB concentration, below G.E. plants, is indicated in blac

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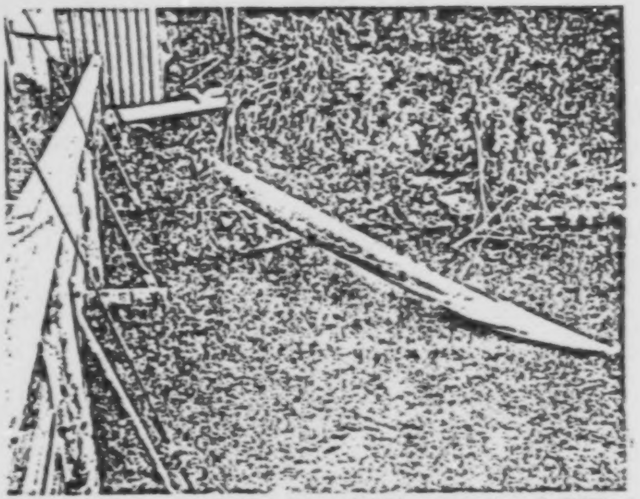
be discarded in dumps where they eventually break open and leak PCB's into the soil. Though Monsanto acted voluntarily, it surely would have been forced into such a ban by a Federal task force then studying PCB's. In Japan, that same year, all PCB production was ordered stopped.

But G.E. continued to be Monsanto's biggest PCB customer; in 1970, it had purchased a record 4,800 tons, and the bulk of it went to the two capacitor plants on the Hudson River. Despite clear evidence of big problems with PCB's, no red flag had yet gone up here. As late as Dec. 31, 1974, in fact, G.E. would be granted a Federal permit, with the full blessings of the D.E.C., to discharge up to 30 pounds per day into the Hudson—not an ounce less than G.E.'s estimate of its own discharge over the previous several years.



A G.E. pipe now discharges negligible amounts of PCB's; next summer, the company will discontinue their use entirely.

G.E. scarcely could have hid its massive PCB discharges, and it never tried. The company had stated baldly that it had been dumping PCB's into the Hudson for a long time at the rate of at least 30 pounds a day. The D.E.C., in approving G.E.'s various permits over the next few years, limited the dumping of certain chemicals — Kjeldahl nitrogen, for example—but it never mentioned PCB's.

Even if the D.E.C. was somehow unaware of the alarms sounded by the experimental research on PCB's, it couldn't have missed the conspicuous presence in its own department of Ward Stone. A wildlife pathologist and militant opponent of PCB's, Stone had begun peppering his superiors with memos in 1969. On Jan. 26, 1972, he proposed that the state monitor everything from ducks to seals for PCB's. The cost of such an initial analysis, he figured, would be no more than $2,400. Noting his particular concern for increasing "juvenile mortalities" in sea birds on Gull Island in Long Island Sound, Stone ended that memo with the warning that "PCB's pose a great threat to the same species that the chlorinated - hydrocarbon pesticides threaten."

In the next few years, Stones memos became more pointed. He began to hop around the state to dig up soil samples where utility poles had fallen and spilled PCB's from broken transformers. These forays apparently made Stone's superiors nervous. At times, they seemed to view him as an errant mouse scooting around the kitchen. After sending out a long memo detailing his findings of up to 18,000 p.p.m. of PCB's in soil around fallen poles, Stone got back a memo from his superior, Herbert Doig, thanking him for his efforts and telling him that others were now at work on the problem—"It will, therefore, be unnecessary for you to devote additional time to the issue." Four days later, Stone wrote Doig: "Unfortunately, your May 7th memo did not arrive until May 10th, and I had already taken more samples and done more exploration into the PCB problem. . . ."

It is plain that, for all his dedication to the job, Stone did not exactly have a gift for gentle persuasion. On May 28, 1974, for example, cutting through several bureaucratic layers, he wrote directly to Carl Parker, chief of the department's Bureau of Fisheries: "I am quite worried about PCB's and feel that their presence is one of the more important wildlife management problems of our time but expect little recognition of this problem in a department that looks at such things as deer poaching and party permits as the leading conservation problem of the day."

If Stone's bluntness got him nowhere from the inside, there is no evidence that anyone could have done better from the outside. As far back as 1971, Robert Boyle—a senior writer for Sports Illustrated, ardent fisherman and author of a book on the Hudson that is remarkable for both its information and its passion—wrote to Parker warning of lab tests he had personally commissioned that showed contamination of roe from Hudson River striped bass at levels as high as 11.4 p.p.m.

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As suddenly as the Highlands have reared up, the river widens out just above Peekskill into the majestic and serene estuary that overwhelmed Henry Hudson, inspired a school of American painters and caused Henry James to advise that a "decent respect for the Hudson would confine us to use of the boat." The estuary is divided by Croton Point into Haverstraw Bay and, directly below, the Tappan Zee. It is here, 42 miles inland, that the Hudson is widest—3.3 miles. Grand as it is, what is most remarkable about this estuary is the unique mingling of huge volumes of fresh water from the Adirondack watershed and salt water from the Atlantic shelf. During the spring runoff, salinity may be almost zero at the Tappan Zee Bridge. In late summer, when rain has been scarce, the upward push of the tide may bring a level of two-thirds sea water. Blue crabs can then be seen scuttling happily on the pilings, not only of the Tappan Zee, but also of the Bear Mountain Bridge, 45 miles from the Battery. And it is not unusual to see a school of bluefish chopping up bait fish on the surface—at the very hour, perhaps, when fishermen looking for such a sight off Barnegat Light are being skunked.

In this meeting of fresh and salt water, rocked by the tide, the river is constantly being agitated. Though the salt water, being heavier, should sink to the bottom, there is actually almost no difference in salinity at any level and, compared with a lake of similar depth, little difference in temperature. Despite its surface calm, the Hudson here is a cauldron, and the product is life. At Glens Falls, 220 miles upriver, hardly more than a dozen species of fresh-water fish can be found. Here in Haverstraw Bay are more than 80 species, of which about half are commonly thought to exist only in salt water. This portion of the river, in fact, is where shad, herring, striped bass and the ancient, lumbering sturgeon come each spring to bear billions of young. Without Haverstraw Bay to act as their nursery, the entire mid-Atlantic seaboard would be an inestimably poorer place.

The best place to get a sense of the life in this estuary is, of all places, the vicinity of the three Con Ed nuclear plants at Indian Point. The power company is busy studying fish life here to see how best to minimize damage from these installations. With two local power companies, it has hired a division of Texas Instruments to do a monumental sampling of everything that moves in Haverstraw Bay. Small and large boats bearing the T.I. symbol can be seen zipping around the estuary at all hours and seasons. And back at the labs, behind the complex of docks at Indian Point, scientists are busy weighing, measuring, cutting open, puréeing and pickling vast numbers of fish.

On a fairly typical business day here one morning last summer, a small Boston whaler manned by two graduate students in biology set out from the docks at 10:30 and sped two miles upriver to a shallow cove. Almost at the bank, they hurled out a 30-foot net into water that appeared too shallow, in fact, to catch fish. But their net filled with no fewer than 37 of a striped bass's favorite fish, slender and silvery alewives, slightly less than a pound each. Out in the middle of the bay, meanwhile, passed the trawler Pocahontas, biggest of the T.I. boats. It was making a seven-minute trawl at a depth of 55 feet. Too often, the trawling nets are ripped open by anchors, ancient wrecks and other submerged obstacles. This trawl, however, comes up with 6 small striped bass, 29 white perch, 2 infant bluefish, 2 catfish, 18 tomcod, 1 Atlantic sturgeon, 10 American eels and what seems like a zillion mini-flounders called hogchokers.

Bigger pickings awaited another T. I. boat when it traveled almost up to the Bear Mountain Bridge at noon to check three stationary nets that had been set four hours earlier. In the first net were a pair of 20-pound carp, heavy-scaled and ponderous. In the third was a magnificent 49-pound striped bass, its glistening back flexing powerfully and its gills flaring angry red as it was disentangled from the net, measured and thrown back. Ardent fishermen can spend a lifetime hurling baits into a chill and inhospitable ocean surf in hopes of catching such a prize. A female or "cow" striper like this one can release up to 10 million eggs into the current where, after being fertilized by attending males, they float free

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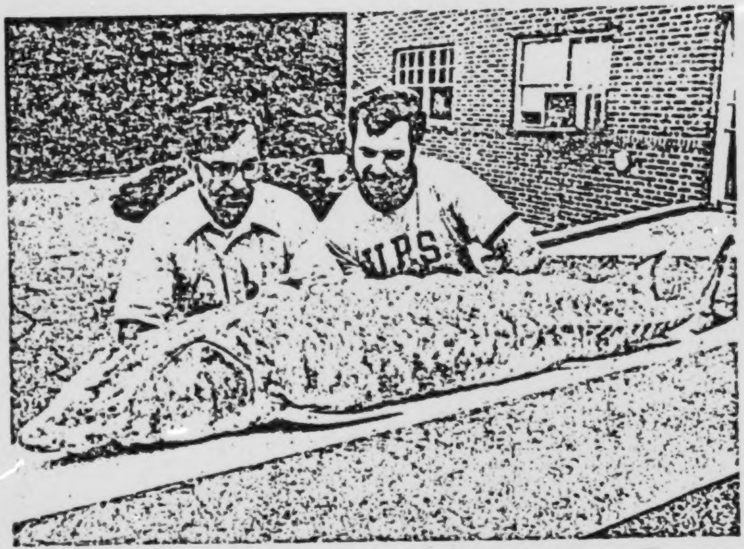
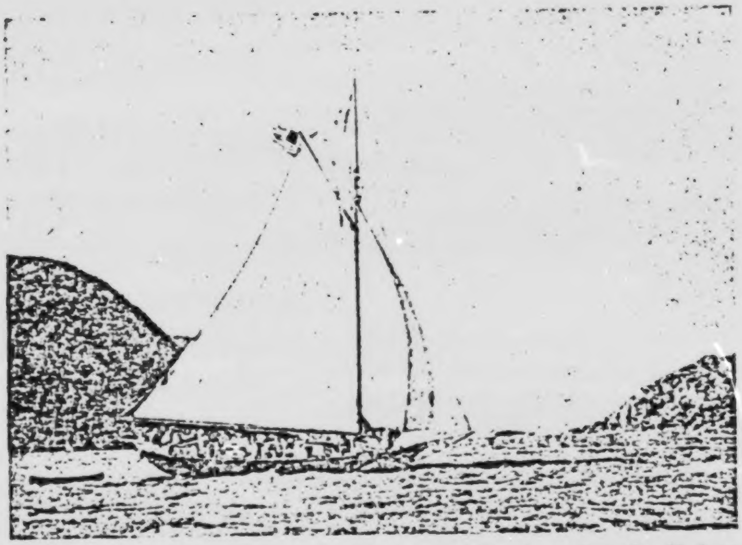


Sturgeon patrol: William Dovel and Marc Crandall of Boyce Thompson Institute in Yonkers examine a 160-pound sturgeon from the Hudson. Dovel also tags live fish with sonic devices to track them up and down the river.



Symbolic sloop: The Clearwater, replica of ships that plied the Hudson in colonial times. To publicize the cause of cleaning up the river, it has served as a concert stage for Pete Seeger and a floating classroom.

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12

for several days until they hatch. It is now thought that at least 10 to 20 percent of all mid-Atlantic striped bass start their lives here on a Hudson River current.

The oddest craft afloat on Haverstraw Bay this day is a 43-foot houseboat whose stern has been drastically modified by a pair of high booms that support a large trawl-and-winch system. This curious hybrid is the creation and domain of William Dovel, a fish biologist for the Boyce Thompson Institute, a private research facility in Yonkers. The T. I. men wave to Dovel, but he is not very enthusiastic about waving back. He regards them warily as big-business, researchers, with big budgets and big Ph.D.'s. Dovel is a loner with hardly any budget and no Ph.D.

Dovel is in the midst of a pioneering project that tracks Atlantic sturgeon when they return to the Hudson after as long as 10 years at sea. Dovel trawls up the smaller sturgeon from his own boat, but for the large ones, he depends on a network of commercial fishermen who call him, whatever the hour, when they find one in their nets. Then Dovel rushes over and implants the fish with a sonic tag that sends out an underwater beep with a range of several hundred feet. He releases the "tagged" sturgeon and, from his houseboat, shadows the sonic beep.

Today is the 16th day Dovel has been following a sturgeon, which is now on the bottom about 40 feet ahead of the boat and only a mile from where it was caught. Dovel already has shadowed it 24 miles upstream to Newburgh. Three days from now he will lose contact 20 miles south at the George Washington Bridge, where the sturgeon presumably heads out to sea. This sturgeon was four feet long, which is nothing for a Hudson River specimen. In his lab, Dovel has one pickled in a coffin-sized crate—a 175-pound creature 7-feet long, the catch last spring of a commercial fisherman named Charlie White.

Besides the pickled sturgeon, Dovel keeps another interesting exhibit in his lab at Boyce Thompson. It consists of 20 pairs of one-quart glass jars lined up on a long table. Each pair contains a sampling of the Hudson River at various points along its full length. In each pair, the first jar simply contains river water, sampled for human-induced bacteria levels. The second jar contains a representative sampling from that same point of phytoplankton, the basic microrganisms on the food chain. Far upstream, where the river is almost wild, the jar bacteria count is not high, but neither is the plankton level. As the samples progress down toward Haverstraw Bay and below, the water gets dirtier, of course, but the samples also show correspondingly more small creatures. The jars from Haverstraw Bay and even from Yonkers fairly teem with tiny crustaceans—pearly, translucent and black-eyed. Many of these samples were taken in sight of oil tanks, factories and even open sewers—yet the resilient Hudson shrugs all that off and approaches the virgin richness of an unspoiled estuarine marsh. — P. H.

Particulate Matter

Introduction:

One of the main air pollutants is particulate matter. It is the easiest to measure because particles are solid while the other pollutants (SO_2, nitrogen oxide, hydrocarbons, CO, photochemical oxidants and others) are gases. The sources of particulate matter include: transportation, fuel combustion from stationary sources, industrial processes, solid waste disposal, and the like, especially smoke of any kind containing particles. It is reported as weight of pollutant in a cubic meter ($\mu g/m^3$). The weight unit is usually micrograms (μ the symbol: it is a millionth of a gram). The EPA (Environmental Protection Agency) reports that 335 tons of particles are given off in New York City on a "good winter day". In a "severely fouled" area, 50-100 tons of particulate matter fall on each square mile per month. The standard for "no health effects" is 150 $\mu g/m^3$ maximum concentration for a 24-hour period (60 $\mu g/m^3$ as an annual geometric mean). How particles affect human health depends on their size, which governs how far into the respiratory system they are carried.

This activity is concerned with a method of measuring the amount of particles in your immediate environment.

Measuring Particulate Matter

Equipment: Chinamarker, glass slide, petroleum jelly, magnifying glass

1. Setting up: with a chinamarker, draw a grid on a glass slide, making sure that each square is of equal size
   a. measure the size of each box
   b. record the number of boxes on each slide

2. Using practice sheet (star picture) and slide with grid:
   a. count "stars" per square in the lower left corner of the picture
   b. multiply area of square by area of entire picture. This will give you the total # of "stars" for the entire picture.

3. Rub petroleum jelly on the slide on the opposite side from the grid. Place the slide jelly side up in any testing area. (Testing area may be set by the class to include school or home windowsills, or any other area where the slides can be exposed to the air undisturbed.)

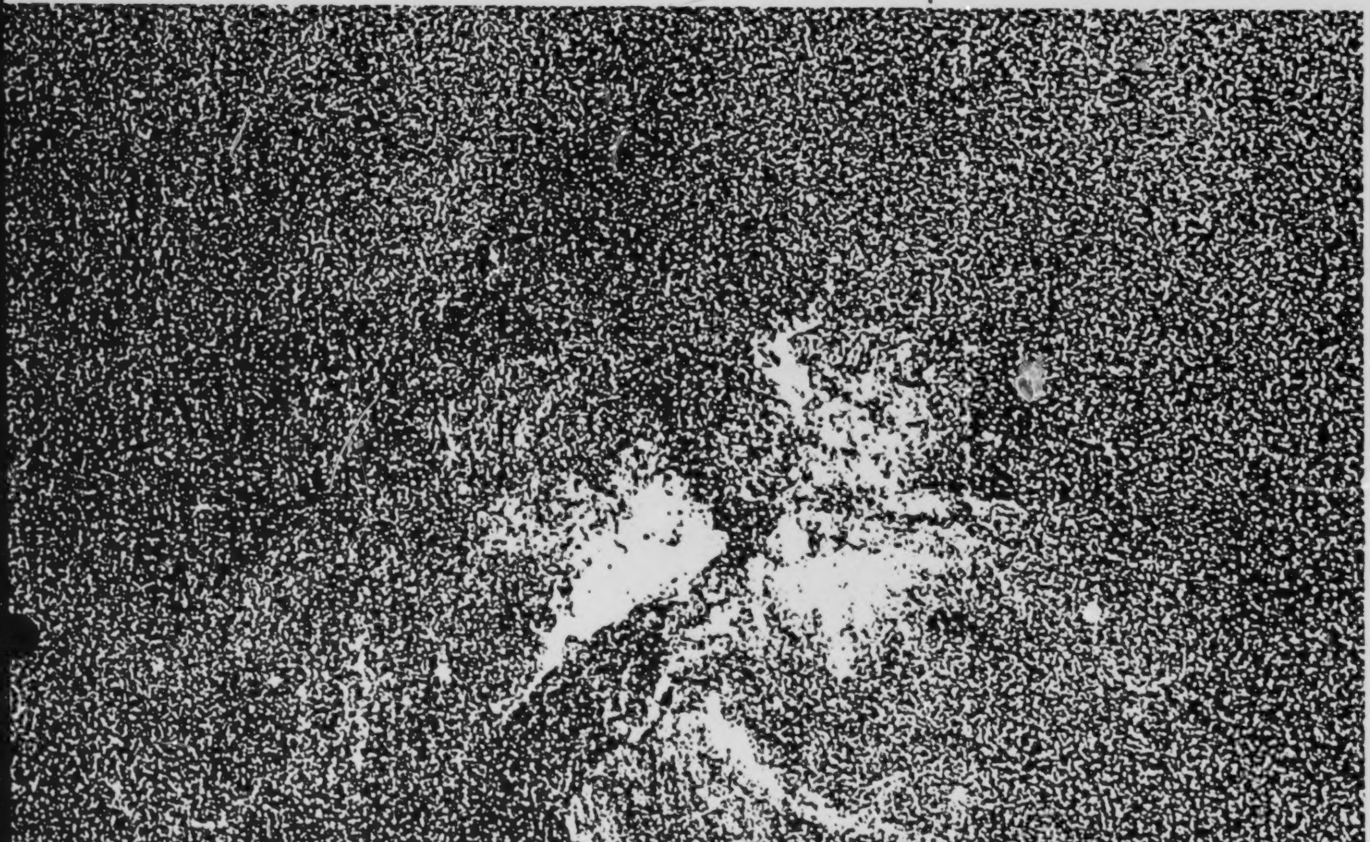
(continued)

4. Set up a chart to record the results as per sample below:

PARTICULATE MATTER MEASURE

Slide #	Location	Total # Particles	# Small	# Medium	# Large	Visibility	General Weather Conditions

5. Count particles on the slide the same way the "stars" were counted.



Abandoned Buildings

Introduction:

The following activity deals with how the plague of vacant, burned-out buildings spreads into the surrounding areas eventually consuming the entire community. As students from the SETH Program wrote in the first issue of the "SETH's Environmental Health Bulletin":

Vacant Burned Buildings in the Environment

By: Sonia DeJesus, Wanda Rivera

Vacant buildings should be securely closed and maintained in safe condition or they should be torn down. There are many reasons for the demolition of burned out buildings. (1) Unhealthy to the environment. (2) Dangerous to the community, such as when children play in these buildings. (3) And last, but not least, they present an ugly appearance.

The National Safety Council advises that children be kept away from abandoned buildings. The danger of playing in such dilapidated structures can't be overemphasized. Broken glass, splintered wood, and protruding rusty nails in such places provide a perfect environment for major injury and infection. Unsafe walls and floors are prone to collapse and crush young children. Rats and other animals that use these places for shelter can transmit serious diseases from a bite or scratch. Some birds, such as pigeons, carry an amazing variety of objects to their nests and are known to carry lighted cigarettes into buildings.

It's dangerous to the community:

Arsonists and vagrants start fires for profit, vengeance or psychological reasons. These buildings must be protected from entry, either by adequate, well maintained fencing with locked gates or by sealing the buildings. There is the "inside job", a building scheduled to be torn down suddenly burning to the ground, thus saving the cost of demolition. Unfortunately this can lead to loss of life, injury and/or destruction of surroundings. Explosions caused by vapor from leaks in underground flammable liquid tanks, gas piping, or abandoned equipment in piping in the building are another hazard. The threat to the neighborhood must be weighed against the cost of protection or demolition.

The legal aspects; what members of the community can do:

National Safety Coundil President, Vincent Tafany, remarked that those individuals or organizations responsible for such property should rehabilitate or demolish the structure. He also noted, however, that it is necessary for the municipal government to pass and enforce laws that can deal with such matters expeditiously before an imminent public danger is created. Fire Commissioner Lowery started a meeting in 1966 about burned out buildings. One result of the meeting was the greatly accelerated program by the demolition section of the housing and development administration to remove unsafe buildings. The Community Relations Bureau of the Fire Department has attempted to seek cooperation of the people of the community to report to the Police Department about acts of vandalism and unauthorized entrance into these buildings.

(continued)

Make a survey of an area of the South Bronx that has the following features within a few blocks of one another.

1. a block with 1 or 2 buildings deserted

2. a block with empty lots and empty buildings

3. a block with a few buildings remaining and few people living in these buildings

A. Make a map of the area surveyed (including the 3 blocks noted above). Indicate: vacant buildings, empty lots, business, services, parks, buildings with few people.

B. Interview some of the older tenants of the apartments and proprietors of the small businesses on each of these 3 blocks for information on how the block has changed. Be sure to include questions about how any vacant and/or burned out building has affected them.

C. Interview tenants of one building per block and ask how long they have lived there, if they have plans to move, if they or anyone they know have made efforts to improve the block.

(Sections A, B, and C. will be done in groups)

Essay: Contact a group involved with renovating buildings, block associations etc., to find out what they are doing to improve the community and write a report.

ACTIVITY II-B-1

INTRODUCTION: "On December 3 to 5, 1930, the densely populated Meuse River Valley, west of Liege, Belgium, was the scene of the first significant, and one of the worst, industrial air pollution disasters. Several thousand persons became violently ill and sixty persons died during the 3-day period." (From: Waldbott, *Health Effects of Environmental Pollution*.)

The above is describing an "episode". Definition: EPISODE - when damage to health occurs in such high proportions that the seriousness of pollution is recognized.

It was the result of too much air pollution in the same place at the same time. This unfortunate experience was repeated in history several times. The following includes graphs, charts, and written data about these episodes. See if you can find out what they have in common. (Use FIGURE 3 for comparison.)

I. Meuse Valley, Belgium

A. Weather conditions

Heavy fog covering the entire valley, high barometric pressure, temperature during the day at, or below, freezing. No wind.

B. Pollutants

25,000 $\mu g/m^3$ SO_2

C. Health Effects

1. Several thousand people ill with respiratory disease; sixty died from acute heart failure. Majority of the affected individuals were elderly people, whose lungs or hearts were already weakened by other causes. However, young and perfectly healthy people also became seriously ill.
2. Victims became hoarse and short of breath; had a persistent cough and coughed up phlegm. Many became nauseated and vomited.
3. Cattle had fast, shallow breathing and acute emphysema. Rats and birds were also affected.

II. Donora, Pennsylvania, October, 1948

A. Weather conditions

High barometric pressure; rainfall, fog and moisture; cold; wind velocity near zero

(continued)

B. Pollutants

~ 1140 $\mu g/m^3$ SO_2 . Dust settling so thick that footprints can be seen

C. Health Effects

1. 20 people died; 42% of the population stricken with irritation of eyes, nost, throat; chest pains. Cough, labored breathing, severe headaches, nausea and vomiting.
2. Highest illness rates were in smokers and those already ill at time of fog.
3. 2 dogs, 7 chickens, 3 casts, 2 canaries, and 2 rats died.

III. London, England, December 4 to 9, 1952

A. Weather Conditions

Cold temperatures (at night, temperatures below freezing), moist air, heavy clouds of smoke from fireplaces, no wind.

B. Pollutants

(carbon particles, CO, SO_2)

2,000 $\mu g/m^3$ black suspended matter

1,145 $\mu g/m^3$ SO_2

C. Health Effects (See FIGURES I and II)

1. More than 100 people died on December 8th of heart attacks while trying to breathe. London hospitals were overcrowded with respiratory diseases.
2. Total death count was estimated to be 8,000
3. Cattle in a ship docked in the harbor developed fast, labored breathing and fever.

(continued)

FILL IN what you think the rest of the following data should be:

IV. New York City, November 23 to 25, 1966 (Thanksgiving Weekend)

A.

B. Pollutants

1,460 $\mu g/m^3$ 24-hour average of SO_2

(2,915 $\mu g/m^3$ - maximum hourly concentration)

C. Daily deaths = 261 compared to 237 expected rate

ACTIVITY II-B-1

FIGURE I

Increase in Mortality in the London Fog of December 1952

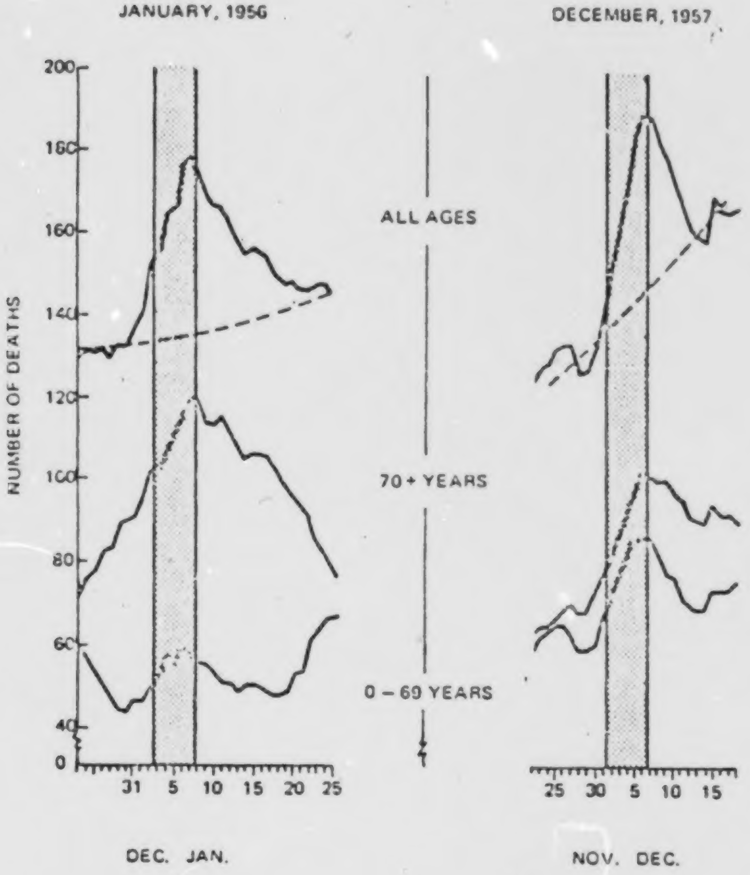
Cause of Death	Seasonal Norm (deaths per week)	Deaths in week after fog	Excess Deaths	Percentage of total Excess Deaths
Bronchitis	75	704	629	39
Other lung disease	98	366	268	17
Coronary artery disease Myocardial degeneration	206	525	319	20
Other disease	508	880	381	24
TOTAL	887	2484	1597	100

Data from: Royal College of Physicians of London (1970)

Statistics for the County of London (population 3.3 million)

FIGURE 2

Mortality figures for the January 1956 and December 1957 Smog "Episodes" in London



From: Air Quality Criteria for Sulfur Oxides
U.S. Dept. of HEW, Public Health Service
Environmental Health Service

FIGURE 3

Episode Criteria for Federal Episode Alert

CO	17 mg/m^3	(8 hour running average)
TSP	375 $\mu g/m^3$	(24 hour running average)
SO_2	800 $\mu g/m^3$	(24 hour running average)
O_3	200 $\mu g/m^3$	(1 hour average)
NO_3	1130 $\mu g/m^3$	(1 hour average)

TEACHER NOTES for
Activity II-B-1

1. Read about one or two air pollution disasters (episodes).
2. Use the information provided in a variety of ways:
   a. Write a story:
      1) about one of the episodes presented
      2) about a future episode
      3) about why a future episode may never happen
   b. Fill in charts on weather conditions, pollutants, health effects
   c. Try to duplicate the weather conditions making a model, weather map, and/or a closed tank using heat lamps and ice.
3. Discussion: temperature inversions
   a. How they are formed
   b. Time of year they occur
   c. How long they last
   d. What they do to disposal of pollutants

ACTIVITY II-III-B

Westway

Introduction:

Most cities and towns have mechanisms for individuals and interest groups to voice their opinions on various issues which are up for decision by local, state, and/or federal governments. Interest groups play an important role in influencing decisions made about any project in questions. Like many other urban environments, New York City holds "public hearings" at which these interest groups may address decision-makers on the issues.

In this activity, the class will participate in a "public hearing"--playing the roles of the Review Board and the various interest groups in the urban environment which may be affected by the introduction of this projected new highway.

I. Read the article entitled, "An O.K. on Westway", from The New York Times, Jan. 9, 1977. Make a list of as many things as you can (at least 10) that will be affected by the construction and subsequent use of this new highway. You will be asked to discuss your findings with the class and compile a class list of all of the different changes that will take place in the environment of the Westside Highway, if the proposed construction plans are carried out. (Use your imagination, along with the given data.) List them below.

II. Through class discussion, decide what interest groups you would expect to find at a public hearing on the Westway. List them below.

(continued)

III. Elect a "review board" to listen to the interest groups and decide how to (or whether to) proceed with the Westway project. Develop criteria for decision-making.

IV. Decide on the interest group you would like to join.

A. In your group, you will have to develop a stand, as a group, on:

What you would like to see happen....How the proposed Westway will affect your group's financial situation... How it will effect your quality of life.

B. Your group would like to find out what the other interest groups are going to say at the public meeting. You would like to be able to persuade groups of differing opinions to see it "your way" and join with you...or, if they won't join your view, you want to make their arguments sound trivial compared to your own.

Develop a strategy to "size-up" the other groups--when you are given time to meet with them.

V. Now that you have assessed the view points of the other groups, develop a presentation for the public hearing. Each group will have a maximum of 5 minutes in which to convey their reasons for proceeding or not proceeding with the construction of the Westway project.

VI. Group presentations

VII. Decision of the Review Board

VIII. Class discussion:

How did you feel about this simulated "public hearing"?

What were the good points of this activity?

What could have improved the quality of this experience...within the group?

... within the class?

What can account for differing viewpoints in a community?

How does/should a community decide whether or not to proceed with projects that have good and bad effects on the community?

The Region

In Summary

An O.K. on Westway

Federal approval of financing for a new road to replace New York's collapsing West Side Highway came last week as expected, and it was met jubilantly by city and state officials and some of the city's labor and business leaders.

The Westway plan calls for a 4.2 mile, 6-lane interstate highway to be constructed, mostly below street level or under landfill, between lower Manhattan and the midtown business district. The decision to approve the Interstate designation, delivered in person by Secretary of Transportation William T. Coleman Jr., is important because the interstate highway funding formula calls for a 90-10 breakdown of grants from Federal and state governments respectively. Thus the $1.16 billion project will theoretically cost the city nothing.

Those present at Mr. Coleman's news conference, including Governor Carey and Mayor Beame, were elated because of the project's potential for revitalizing the city's troubled economy, particularly by providing thousands of jobs in the depressed construction industry, and its potential for redeveloping the city's deteriorating waterfront.

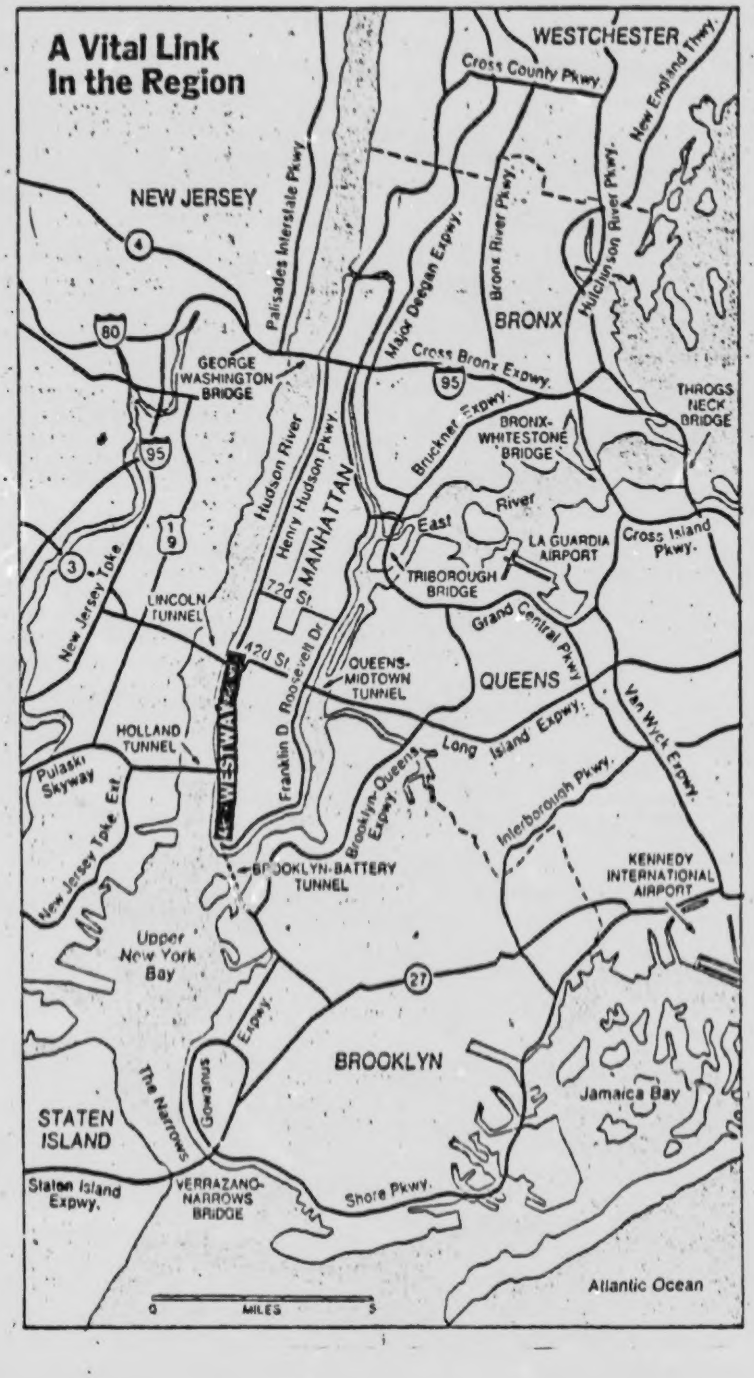
Critics, among them six members of the city's Congressional delegation, said that this kind of money would be better spent on mass transit than on more highways. Mass transit construction, they argued, would provide even more new jobs.

In addition, some critics warned that the truck traffic permitted on Interstate routes, plus increased traffic volume attracted by the new road would add to the city's already high noise and air pollution levels. West Side residents also fear that, eventually, noisy truck traffic will be permitted beyond Westway, all the way to the George Washington Bridge.

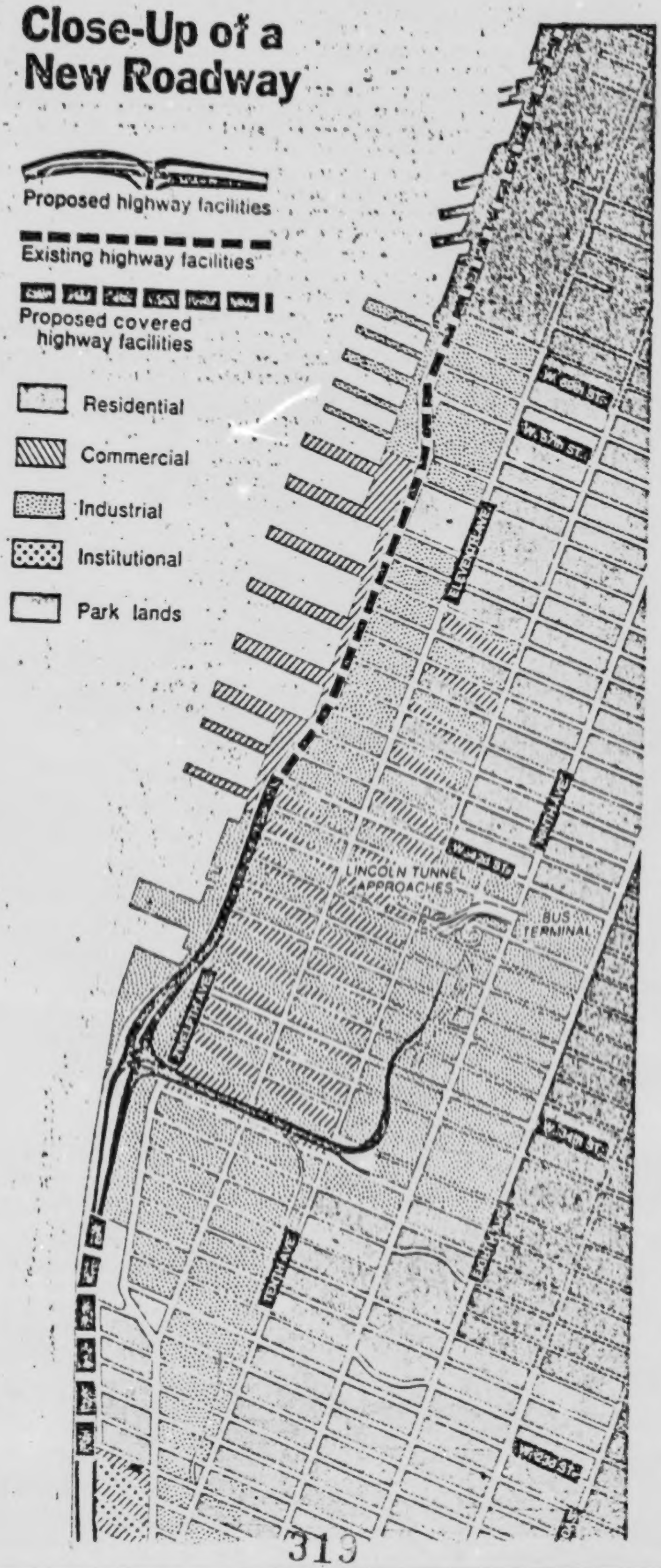
Whether the optimism expressed at the news conference is justified depends on several variables. Though the new road will provide immediate job relief for some and, eventually, better access to business districts for commercial traffic, it cannot by itself attract jobs and businesses to the city. More fundamental changes in the city fiscal structure are needed to reverse the business exodus.

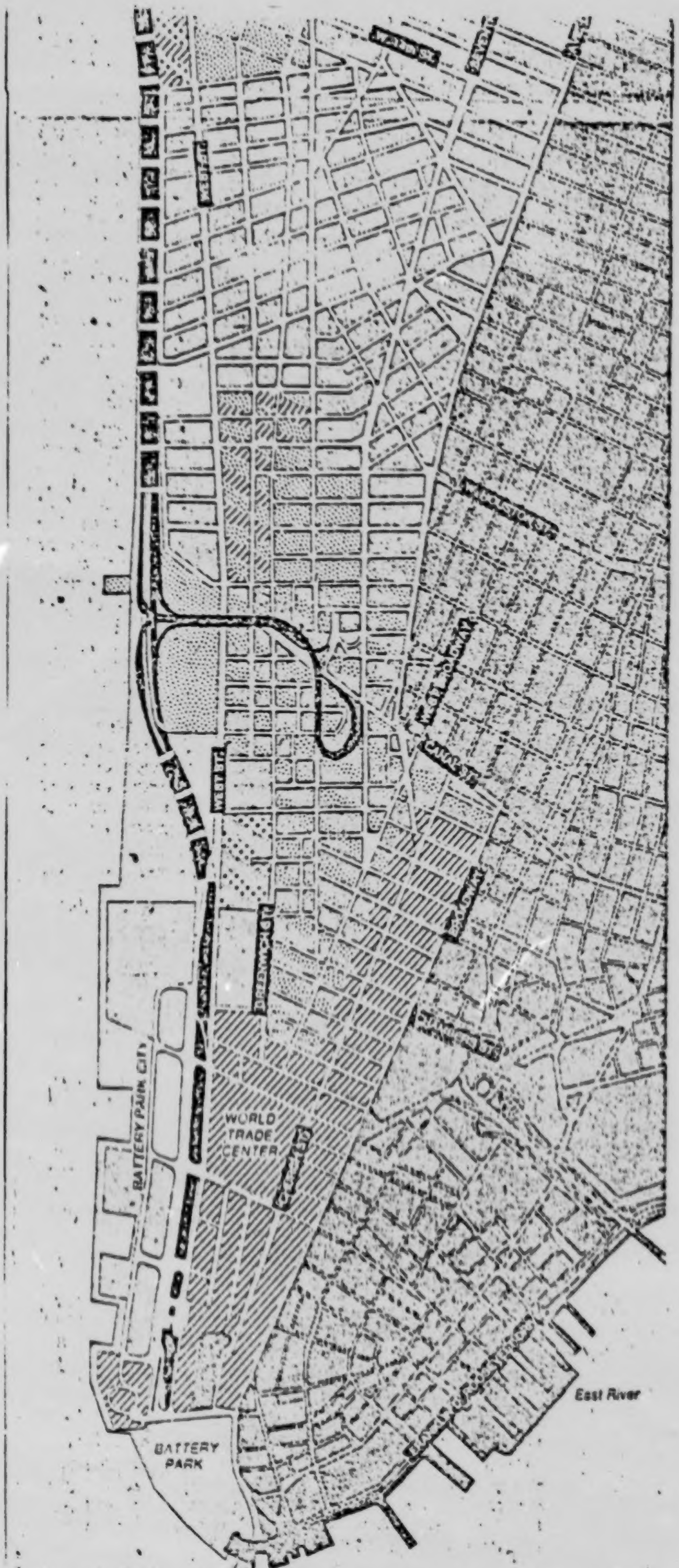
The landfill provided by the project will remain just that—landfill—unless the city finds money to develop it. Other city development plans have been stalled indefinitely because of the city's fiscal situation.

Some of the criticism seems unwarranted. Mr. Coleman attempted to assuage the mass-transit proponents by announcing a $78.5 million grant to the Metropolitan Transit Authority, and by explaining that the money for Westway could not simply be transferred to mass transit projects. And Westway planners maintain that by moving the traffic off and away from local streets, pollution levels in residential areas will actually be reduced.


A Vital Link
In the Region
WESTCHESTER
Cross County Pkwy.
New England Thwy.
NEW JERSEY
Palisades Interstate Pkwy.
Hutchinson River Pkwy.
Bronx River Pkwy.
Major Deegan Expwy.
4
80
BRONX
GEORGE
WASHINGTON
BRIDGE
Cross Bronx Expwy.
95
THROGS
NECK
BRIDGE
Bruckner Expwy.
BRONX-
WHITESTONE
BRIDGE
Hudson River
Henry Hudson Pkwy.
MANHATTAN
East
River
LA GUARDIA
AIRPORT
Cross Island
Pkwy.
1
9
3
New Jersey Tpke
72d St
TRIBOROUGH
BRIDGE
LINCOLN
TUNNEL
Grand Central Pkwy.
42d St
WESTWAY
Franklin D. Roosevelt Dr.
QUEENS-
MIDTOWN
TUNNEL
QUEENS
Van Wyck Expwy.
HOLLAND
TUNNEL
Long Island Expwy.
Pulaski
Skyway
New Jersey Tpke Ext.
Brooklyn-Queens
Expwy.
Interborough Pkwy.
BROOKLYN-BATTERY
TUNNEL
KENNEDY
INTERNATIONAL
AIRPORT
Upper
New York
Bay
27
Expwy.
BROOKLYN
The Narrows
Gowanus
Jamaica Bay
STATEN
ISLAND
Staten Island
Expwy.
VERRAZANO-
NARROWS
BRIDGE
Shore Pkwy.
Atlantic Ocean
0
MILES
5

Close-Up of a New Roadway





BATTERY PARK CITY
WORLD TRADE CENTER
BATTERY PARK
East River

How pollutants enter the body

Introduction:

This activity deals with how a pollutant finds its way into the human body. In order to produce a disease, a pollutant must first enter the body by one or more of 4 ways: inhalation, contact, ingestion, injection (intramuscular, intervenous). The mode depends on the pollutant's state of matter (solid, liquid, gas) which, in turn, determines how the pollutant is transmitted in the environment (air, water, on food, personal contact, and so on).

Complete the chart on the following page.

(continued)

POLLUTANT	PRODUCT/SOURCE ASSOCIATED WITH	STATE OF MATTER	MEANS OF TRANSMISSION	MODE OF ENTRY
Sulfur oxides				
Nitrous oxides				
Carbon monoxide				
Hydrocarbons				
Lead				
Mercury				
Cadmium				
Asbestos				
Dust				
Dichloro-diphenyl-trichloroethane (DDT)				
Polyvinyl chloride (PCV)				
Freon				
Chromium				
Hydrogen sulfide				
Noise				
Radioactivity				
Oil				
Pesticides				
Solid Waste				
Strontium 90				
Carbon (soot)				
Ozone				
Arsenic				
Polybrominated biphenyls (PBB)				
Polychlorinated biphenyls (PCB)				

TEACHER NOTES for
Activity III-I-A-1 thru 5

1. A variety of resource materials can be used for this activity.

2. Note that some of the pollutants are not states of matter, but are energy (noise, radioactivity). Bring this out in the discussion after the activity is completed.

Classification of Pollutants According to Their Health Effect

Introduction:

The major atmospheric pollutants may be classified into 3 groups according to their effect upon human health. (Many toxins act upon several parts of the body, causing multiple effects, therefore pollutants are categorized by their main toxic action upon the human organism.)

1. Poisons which have a major impact upon human tissues in the lung are called respiratory pollutants. These pollutants are generally inhaled. The organs affected by the inhalation of toxins are the nose, sinuses, pharynx, larynx, bronchial tree and lung tissue. Respiratory pollutants may also affect respiration in the cells by interfering with the proper functioning of hemoglobin as well as those which interfere with normal functioning of and affect the respiratory center.

2. Poisons which are classified as systemic pollutants affect more than organ system. They enter the body mainly through the gastro-intestinal tract and are carried through the bloodstream to various organs where they tend to settle. Commonly associate with systemic pollutants are: bowel disorders, stomach disorders and diseases of the central nervous system and urinary tract.

3. A third category of toxic effect includes host-specific pollutants. This group is composed of respiratory and systemic pollutants which trigger allergic, carcinogenic and/or mutagenic reactions in individuals. The target organs in each case seem to depend on an individual's susceptibility to the toxic agent.

(Edited from: Waldbott, Health Effects of Environmental Pollutants)

Looking at the figure showing the main targets (in the human body) of 28 major air pollutants:

A. Fill in the names of the pollutants and their "target" organs.

B. Refer to a biology textbook and decide what organ system is affected by each pollutant (i.e. Nervous, Circulatory, Respiratory).

C. Using the information in the introduction to this activity, determine under which of the 3 groups the atmospheric pollutant can be classified.

(continued)

NAME OF POLLUTANT	TARGET ORGAN(S)	SYSTEM(S) INVOLVED	GROUP
1.			
2.			
3.			
4.			
5.			
6.			
7.			
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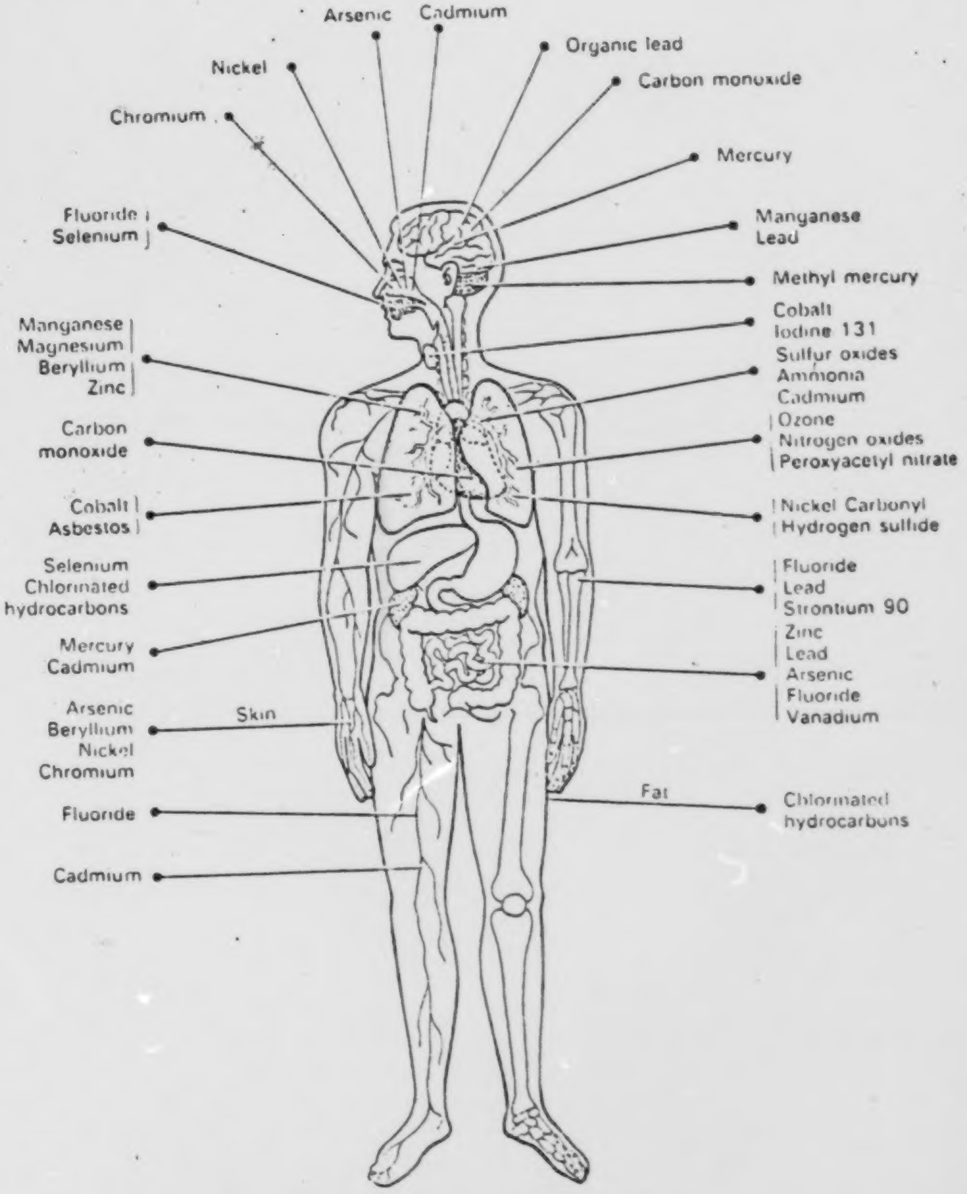


Fig. 6-18. Main targets of major air pollutants.

Crime and Delinquency, Drug Abuse and Alcoholism

Introduction :

This activity explores drugs (which includes alcohol) as they are presented in the media (books, magazines, newspapers, TV, advertising, popular music), possible reasons for drug use other than prescribed drugs, and the social cost of the use and abuse of drugs.

A. Look at magazines and newspapers (both ads and stories), television (both commercials and shows), read books (Both fiction and non-fiction), and listen to the words of the songs you hear on records or the radio. Note the various types of people and the situations involved using drugs (including alcohol). Make several (5 or 6) copies of a survey sheet as noted below. Fill them in over a period of time, as you note the users of drugs in various situations.

The survey should include all of the following categories:

1. What drug was involved in this situation? (marihuana, heroin, etc.)
2. Where did you see or hear the situation?
3. Who are the users? (Describe as per below)
    a. class (upper, middle, lower, hippie, mixed)
    b. occupation or setting
    c. type of user (tryer/experimenter, recreational/social, heavy, dysfunctional abuser)
4. The user's attitude toward the drug
    a. going along with antisocial attitudes
    b. going along with the p-er group
5. Your attitude toward the user
6. Law enforcement involved
7. Is it a casual reference, a segment or chapter, main theme, etc.?
8. Circumstances of use
9. Effects of use
10. Medical treatment involved, if any

(continued)

B. Study the Table below and answer the following questions:

Comparison of Reasons for Starting Drug Use (Other Than Alcohol)
Between Doctors and Nurses

Nurses			
Fatigue	37	Overwork	41
Ailments	34	Ailments	36
Family terminations	19	*Magical Thinking	32
Quarrels	18	Marital Difficulties	31
Ambivalence	11	Level of Aspiration	24
Insomnia	11	Mood Effects (Changes)	21
*Magical Thinking	7	Alcohol	17
Age	7	Insomnia	11
Retirement	6	Age	3
Misinformttion	5		216
Alcohol	2		
	157		

*Magical Thinking = users thought they would not become addicted and that they would "know where to stop".

From: "Drug Dependence Among Nurses", Charles Winich, in Socialogical Aspects of Drug Dependence.

1. List "reasons" that are work related. What is the total %?

2. List "reasons" that are related to self-esteem. What is the total %?

(continued)

3. List "reasons" that deal with interpersonal relationships. What is the total %?

4. Which reasons do not fall in the other 3?

5. Do you think the 3 categories above (in 1, 2 and 3) are different for a "street addict"? Why or why not?

(continued)

C. Summary of Social Costs

NIMH = National Institute of Mental Health

(flat-footed hustling - cash transfers of fenceable property; involved in shoplifiing, burglary, and robbery)

Look at Table #20 - PART A: Costs of illegal and other undesirable behavior

1. List expenditure categories of the:

   a. federal government $

   b. State, County and Local government $

2. Add expenditures in #1 (a & b) + __________

   $

3. List expenditures for preventive measures $

4. Add expenditures in #3 + __________

   $

5. Add expenditures by private individuals and philanthropies + $__________

   $

Look at Table #20 - PART B: Narcotic law violations

1. Add expenditures of federal, state, county and local governments.

   Compare to PART A

2. Add expenditures for preventive measures.

   Compare to PART A

(continued)

3. Add expenditures by private individuals and philanthropies.

   Compare to PART A. (What does a (-) minus sign in front of the number mean?)

4. What is not included in #2 that might be included (e.g. Synanon, etc.)

5. How much of all crime is related to narcotics according to this data?

TABLE 20

Summary of Social Costs

Type of cost	Total	Government expenditures: Federal: NIMH	Government expenditures: Federal: Other	Government expenditures: State, county, and local	Private individuals and philanthropies	Reduction in tax revenues	Social insurance and public welfare	All households (except that of the addict)	Borne by addicts and their families
Tangible costs									
Cost of illegal and other undesirable behavior	$862,877,172		$17,254,000	$322,123,173	$392,000,000			$131,500,000	
Cost of crime resulting in physical injury									
Cost of crime resulting in death for the victim									
Cost of crime resulting in property damage									
Cost of crime resulting in the forced exchange of goods	813,697,173			290,197,173	392,000,000			131,500,000	
Cost of the criminal justice	290,197,173			290,197,173					
Police	96,372,093			96,372,093					
Courts	12,587,572			12,587,572					
Penal institutions	181,237,508			181,237,508					
Probation and parole									
Cost of privately owned devices and purchased services employed to prevent loss from criminal activities	523,500,000				392,000,000			131,500,000	
Protective services and equipment	465,000,000				348,000,000			117,000,000	
Insurance	58,500,000				44,000,000			14,500,000	

TABLE 20 (continued)

		Government expenditures							
		Federal							
Type of cost	Total	NIMH	Other	State, county, and local	Private individuals and philanthropies	Reduction in tax revenues	Social insurance and public welfare	All households (except that of the addict)	Borne by addicts and their families
Cost of crime resulting in the illegal sale of goods and services (narcotic law violations only)									
Cost of the criminal justice system	49,180,000		17,254,000	31,926,000					
Police	15,376,000		6,400,000	8,976,000					
Courts	727,000		727,000						
Penal institutions	30,400,000		9,400,000	21,000,000					
Probation and parole	2,577,000		727,000	1,850,000					
Cost of privately owned devices and purchased services employed to prevent addict crime and to apprehend addict criminals.									
Any cost (present or future) in caring for the victim.									
Cost of organized crime's involvement in addiction									
Transfer payments									
From	0				-822.8			-279,000,000	1,101,900,000
Shoplifting	0				-372,400,000				372,400,000
Burglary	0				-300,000,000			-100,000,000	400,000,000
Robbery	0				-40,400,000			-25,700,000	66,100,000
Flat-footed hustling	0				-110,000,000			-110,000,000	220,000,000
Prostitution	0							43,400,000	43,400,000

ACTICITY III-III-A-1

Effect of Multiple Factors: Stress

Introduction:

The Psychiatric Dictionary definition of "stress" is "any interference which disturbs the functioning of the organism at any level, and which produced a situation which is natural for the organism to avoid". More succinctly, "...any change (desirable or undesirable) in on-going life patterns".

According to a study, the order of stress-producing events from most stressful is:

1. death of spouse
2. divorce
3. marital separation
4. jail term
5. death of close family member
6. personal injury or illness
7. marriage
8. fired from job
9. marital reconciliation
10. retirement

This is the same ordering, regardless of age, sex, race, income, and cultural populations of adults.

In coping with stress, a person either seeks to change the environment or the reaction to the stress. Coping can be either socially acceptable or not. Examples include: avoiding potential stress-producing situations, engaging in psychotherapy, praying, withdrawing, and using tranquilizing drugs.

(From, "Risk of Being Labeled 'Alcoholic': Significance of Psychiatric Status and Nationality", Wendell R. Lipscombe and Jay Holden in Socialogical Aspects of Drug Dependence, C. Winick ed.)

A. Read Chapter 3 - "Stress" in Work is Dangerous to Your Health, Stellman and Daum. Then answer the following questions:

1. What is the biological stress reaction?

(continued)

2. List stress-related diseases:

3. How is stress in the workplace related to the following?

   a. fatigue

   b. work hours

   c. finances

   d. dangers at work

   e. competition

   f. personal inadequacy

(continued)

g. comradeship (or the opposite, isolation)

h. worker's control over the job

B. List at least 10 stressful situations you have experienced in the last 24 hours.

(continued)

C. Harriet lives in a suburb of a large, eastern city called Megopolis. Everyday she travels by car into the city where she works as a secretary in a large business firm, Brand "X" Products, Inc.

On September 6th, after the Labor Day Weekend, there is a temperature inversion, forming smog that covers Megopolis. But, this morning is no different for Harriet, who wakes up to the sound of the garbage trucks that pick up garbage in front of her house at 6:00 A.M. Harriet starts to get a headache from the noise from the moment she gets out of bed.

On her way to work, Harriet listens to the radio - "...the air auality is expected to get worse as the day progresses...". She believes it when she looks into the mirror to see her eyes watering. In spite of the aspirin she took, her headache seems to be getting worse. Then suddenly "CRASH". Harriet's head is jolted forward as she bangs into the car in front of her.

The "fender-bender" is soon taken care of without calling the police; a matter for Harriet's insurance company. But now she is late for work and a parking spot will be difficult, if not impossible, to find.

What does Harriet do? Write one or more paragraphs ending the story in each of the following 3 ways:

a) escapes
b) seeks help
c) deals with it

ACTIVITY III-IV-B-2

Coping with ill health - Security

Introduction:

This activity deals with the expenses of being sick and measures that enable a person to be less vulnerable to these expenses. Available measures include prevention of illness and the various insurances both public and private.

I. Expenses

A. Look at Figure 1 - Annual Economic Cost: 1963.

1. List "direct expenditures" (i.e. doctor bills):

2. List "indirect costs" (i.e. wage loss):

3. List "indirect costs" of illness that cannot be figured in dollars, but mean a great deal to a family where somebody is ill:

(continued)

B. 1. Rank the order of morbidity and mortality rates - highest to l lowest - of "direct expenditures":

2. Rank the order of morbidity and mortality rates - highest to lowest - of "indirect costs":

(continued)

II. Prevention:

A. Look at charts A and B.

1. How much money is provided for preventive care in the private insurance plan (A)?

How much in the public plan (B)?

2. How much money is paid by the indivudual under the private plan (A)?

How much under the public plan (B)?

B. 1. List preventive measures you can take on a daily basis to stay well (i.e. food you eat):

2. What are the cost factors in staying well?

(continued)

3. Estimate the cost per year of staying well?

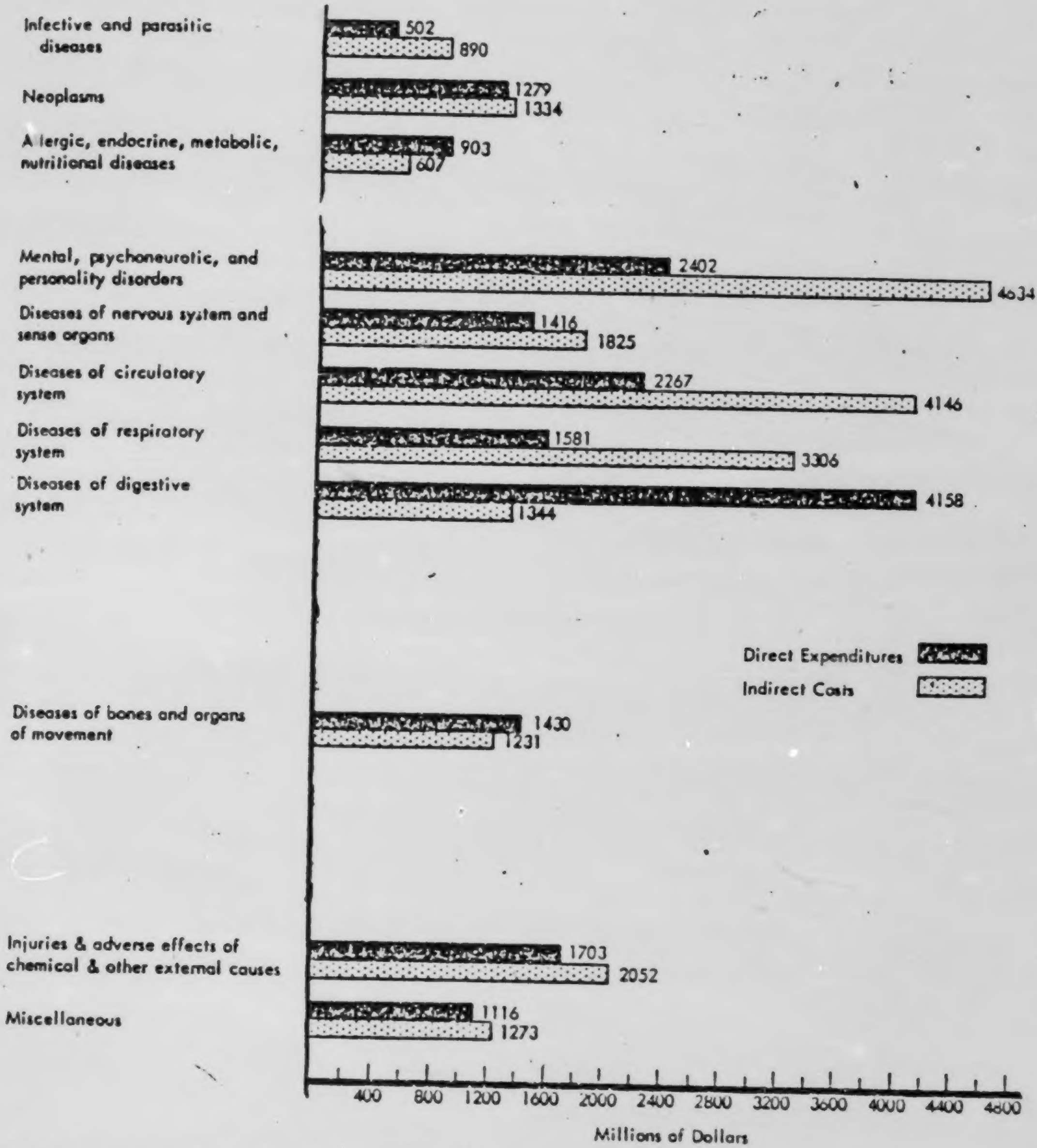
DO ALL COSTS GO FOR MEDICAL CARE?

WHAT ARE INDIRECT COSTS?

ACTIVITY III-IV-B-2

Figure 1

ANNUAL ECONOMIC COST: Direct Expenditures and Indirect Costs of Morbidity and Mortality, by Diagnosis, 1963



We all know something about the direct costs of illness.
These are what must be paid to doctors, hospitals and for medicines.

Are indirect costs important too? What do costs of MORTALITY & MORBIDITY mean? Some of the indirect costs in the table above included wages lost by not working, loss of housewives services. Can you list indirect costs of illness that cannot be figured in dollars, but mean a great deal to a family when somebody is ill?

Could you estimate the costs of staying well? Good housing, nutrition, sanitation, safety?

CHART A

Blue Cross–Blue Shield plans

BASIC PLAN		
BENEFITS	**MEMBERSHIP IN AN EMPLOYEE ORGANIZATION NOT REQUIRED**	
Hospital room and board	Pays up to a *semi-private* rate for up to 1st 70 days of hospitalization	
Hospital services	*Provides full payment during the 1st 70 days of hospitalization including special care units such as I.C., etc.*	
Surgical	*Provides payment in full*	
Anesthetist	*Provides payment in full*	
Additional accident or emergency illness benefit	Provides up to $100 per calendar year for dependents requiring nonsurgical services	
Hospital diagnostic x-ray and laboratory	Provides full payment when hospitalized primarily for the treatment of an illness or injury	
Outpatient diagnostic x-ray and laboratory	Provides up to a maximum payment of $150 per person per calendar year for illness. No maximum for accidents	
Doctor's hospital calls (all members)	Provides full payment during 1st 70 days of hospitalization for routine calls. Includes payment for approved consultations	
Doctor's office calls Employee and annuitant (No coverage for family members)	*Provides full payment for accident* *Provides full payment for illness*	A $25 deductible per person per calendar year applies for illness *only*
Doctor's home calls Employee and annuitant only (No coverage for family members)	*Provides full payment for accident* *Provides full payment for illness*	
Maternity	Provides payment up to $75 to hospital; $100 to the physician These benefits are provided after 9 months of membership	
Ambulance	Provides payment up to $50 each accident or sickness (does not apply to maternity cases)	

MONTHLY PREMIUMS		
	Employee only	$26.18
	Employee and one dependent	46.61
	Employee and two or more dependents	54.34

MAJOR MEDICAL PLAN	
I. *Maximum benefit for each disability*	$50,000 maximum amount payable
II. *Deductible for benefits other than outpatient drugs*	$200 of covered charges per person
III. *Deductible for outpatient drugs*	$75 of covered charges per person
IV. *After deductibles shown in items II. and III., plan pays (except as otherwise noted)*	80% of 1st $15,000 100% of next $38,000
1. Physician's medical or surgical services	
2. Services of a registered nurse, licensed vocational nurse or licensed physiotherapist	
3. Hospital room and board	Not to exceed semiprivate rate
4. Hospital services and supplies	
5. Hospital intensive care unit	
6. Extended care facility	$25 per day; $5,000 lifetime maximum payable
7. Diagnostic x-ray and lab examinations	
8. X-ray, radium and radioactive isotope therapy	
9. Rental of wheelchair, hospital bed, iron lung and other durable equipment	
10. Artificial limbs and eyes	
11. Speech therapy	$5,000 lifetime maximum payable
12. Outpatient prescription drugs	
13. Mental illness—while hospital confined for at least 21 consecutive hours	

MONTHLY PREMIUMS		
	Employee only	$1.62
	Employee and one dependent	3.48
	Employee and two or more dependents	3.99

From Public Employees Retirement System, Health Benefits Division. Open enrollment period for health benefits plans under the State Employee's Medical and Hospital Care Act, effective April 1, 1973, Sacramento, 1973, California State Printing Office.

CHART B

Comparison of Medicare and Medicaid Services

	MEDICARE	MEDICAID
Administration	Social Security Office Federal insurance program	Local welfare office Federal-state partnership assistance program
Financed	Trust funds from Social Security Contributions from insured	Taxes from federal, state, local sources
Eligibility	People 65 years and older	Needy and low income, 65 years and older, blind, disabled, members of families with dependent children, some other children, possibly others
Benefits	Same in all states *Hospital insurance (Part A)* Up to 90 days each benefit period, patient pays first $104 and $26 daily in coinsurance 61st through 90th day Up to 100 days extended nursing home care each benefit period, patient pays $13 after first 20 days up to 80 days; no provision for custodial care, private duty nurses, television or phone, and physician bills Up to 100 home health visits each benefit period Up to 190 days in psychiatric hospitals as lifetime limit	Varies in all states *Hospital services* At least these services: inpatient hospital care, outpatient hospital services, other laboratory and x-ray services, physicians' services, screening, diagnosis, and treatment of children, home health care services Pays what Medicare does not pay for eligible people
	Medical insurance (Part B) Deductible $60 annually Coinsurance for 80% of reasonable additional charges Services: physician care, physical therapy with $80 limit for home and office care, psychiatric services with $250 limit outside hospital, radiology and pathology, outpatient services including emergency room or clinic, 100 physician-approved home health visits yearly Other services: casts, splints, surgical dressings, artificial eyes and limbs, crutches, wheelchair Exclusions: dentures, regular dental care, glasses, eye exams, hearing aids, immunizations, orthopedic shoes, prescription drugs, patent medicines, routine physical checkups	*Medical services* Many states pay for dental care, prescribed drugs, eye glasses, clinic services, and other diagnostic, screening, preventive, and rehabilitative services Medicaid pays the $60 Medicare does not pay for eligibles
Premium costs	Hospital insurance (Part A): none Medical insurance (Part B): $6.70 monthly by eligible person	None; federal government contributes to states 50% to 80% of costs for needy and low-income people

Adapted from U.S. Department of Health, Education, and Welfare, Medical Services Administration, Social and Rehabilitation Service: Medicaid, Medicare: which is which? Washington, D.C., 1971, Superintendent of Documents.

Discuss the various aspects of the sick role as a worker*, parent, student. Also the different conditions of health-disabled, ill for a long time, ill for a short time, and how this affects the ability to carry out the role of worker, parent, student, etc.

After the student has completed the activity, discuss "an ounce of prevention is worth a pound of cure".

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* For Workmens' Compensation, OSHA, NIOSH - see Mini-Course V.

BEHAVIORAL OBJECTIVES

I-A-3. Process Foods and Consumer Habits

After completing this activity, the student will be able to:

1. list the uses of 5 different food additives
2. suggest that non-processed foods are more expensive than processed foods
3. explain how processing does not necessarily mean that foods are more nutritious

I-B-1. Burning Cloths

After completing this activity, the student will be able to:

1. list uses of fabric in the home
2. determine the appropriateness of fabric uses in terms of how they burn
3. name different kinds of fabrics and describe their burning patterns

I-B-2 Tris, etc.

After completing this activity, the student will be able to:

1. describe how the federal government protects the consumer against product health hazards
2. list 4 health hazards from apparel that the consumer comes into contact with because of buying practices
3. make observations as to why people select the apparel they do

I-C-1 & 2. Shelter

After completing these activities, the student will be able to:

1. list 20 factors that determine the quality of the housing where they live
2. construct a floorplan and/or model of living space
3. determine personal and shared space, using a floorplan and/or a model

I-D-1 & 2. Energy

After completing these activities, the student will be able to:

1. compare fossil fuel with solar energy in terms of cost to the individual
2. list 2 governmental agencies involved in homeowner energy use
3. explain why the federal government is in favor of the use of solar energy

(continued)

I-E-1. Transportation

After completing this activity, the student will be able to:

1. organize data on vehicles from their own observations
2. graph and analize information from data they collect on vehicles
3. discuss how the use of vehicles exposes other people to unhealthy air quality and noise levels

I-F-1. Medicine

After completing this activity, the student will be able to:

1. list 5 ways the storage of medicines is important to family health
2. write a definition of drugs and give 10 examples of commonly used drugs
3. describe what is included on medicine labels

I-F-2. Cosmetics

After completing this activity, the student will be able to:

1. list 5 potential cosmetic health hazards
2. suggest that cost, quality, and product safety, in the cosmetic industry, are not directly related
3. describe falso advertising

II-A-1 thru 4. Pathogens, etc.

After completing these activities, the student will be able to:

1. define "pathogen", "teratogen", "mutagen", and "carcinogen" and give 2 examples of each
2. list advertisements that include a statement about product safety
3. describe the process the FDA goes through to determine product safety

II-B. USRDA

After completing this activity, the student will be able to:

1. calculate how many calories a boy and girl would need per day in order to maintain their weight
2. calculate the price paid for each nutrient/serving listed on a nutrition label
3. compare one product with another, in terms of price paid for the nutrition available from the product
4. list things an individual can do if they feel cheated or overcharged for a product

(continued)

III-A thru C. Personal Purchasing Patterns

After completing this activity, the student will be able to:

1. classify purchases as to "needs", "wants", and "shoulds"
2. describe their own buying practices

IV - Consumer Health Hazards

EVALUATION

(Pre-Test/Post-Test)

Circle the correct answer.

1. Calcium propionate is an example of a

   a. coloring agent b. flavoring agent c. nutrition enhancer

   d. spoilage retardant

2. An example of "quackery" in product promotion is

   a. hexachlorophene b. wrinkle cures c. face cream

   d. nutrition supplements

3. The best example of words used in advertising to mislead the consumer

   a. "secret remedy" b. "fast acting" c. "long lasting"

   d. "costs less"

4. Who is it best to complain to first if you feel you have been cheated or overcharged?

   a. family and friends b. manufacturer c. representative in congress

   d. a lawyer

5. A teratogen is an agent which causes

   a. mutation b. cancer c. birth defects

   d. illness

6. When a nutrient is 8% of hte USRDA, it means

   a. you MUST have 92% more of that nutrient that day to be healthy

   b. you NEED 92% more of the nutrient for that day in order to be healthy

   c. you NEED 92% more of the nutrient that day in order to meet the recommended amount for an average person

   d. you NEED approximately 92% more of the nutrient in order to maintain your body weight

(continued)

7. In order to develop a healthy mind and body, a young child must have

   a. high calorie foods b. protein c. low-calorie foods

   d. non-fat food

8. "Tris" is

   a. a fabric b. a child's garment c. a carcinogen

   d. flammable

9. The energy "crisis" is based on the fact that

   a. fossil fuel resources are running out

   b. nuclear energy is inefficient

   c. use of solar energy raises property taxes

   d. there are too many cars on the road

10. A poorly maintained building is

    a. unimportant as long as the tenants get along with one another

    b. unimportant because these conditions probably won't effect your physical health

    c. important to mental health

    d. important because you won't have to pay more rent

11. It would cost a homeowner $2,000 to install solar heating. The taxes on the home would go up 10% on a $30,000 home. Fuel bills for the house average $3,000 a year. How much money would the homeowner save if you calculated the total expenses for 10 years?

    a. $1,000 b. $3,000 c. $5,000

    d. would not save money in 10 years

(continued)

12. A common argument for greater use of public transportation (buses, cabs, subways) is

    a. no more noise pollution b. no more air pollution

    c. less maintenance cost for public vehicles

    d. less cost for the passenger (consumer)

13. The U.S. Food and Drug Administration

    a. establishes standards for automobile emissions

    b. oversees product labeling

    c. checks the accuracy of TV advertisements

    d. makes sure a harmful product is not sent through the U.S. mail

14. Food coloring

    a. makes the products look better

    b. makes the product taste better

    c. increases the food value of the product

    d. does not have any use

15. Consumer health hazards are, to a great extent, caused by:

    a. EPA

    b. what people buy

    c. the government

    d. advertising

IV - Consumer Health Hazards

ANSWER KEY for
EVALUATION

1. d
2. b
3. a
4. b (as recommended by local consumer groups)
5. c
6. c
7. b
8. c
9. a
10. c
11. d
12. d
13. b
14. a
15. b

"The Luncheon"

I. Read the short story, "The Luncheon", by Somerset Maughm.

II. Write a 150-200 word composition on "The Luncheon" that addresses these 2 issues:

A. Why did the lady see herself as a small eater?

B. Why did she eat so much?

OR

III. Write a composition about someone you know who over-consumes food, or has an unusual attitude or behavior related to food.

IV. Three to five students are selected to read their compositions in class.

V. Discussion, led by teacher.

VI. Role play: the same scene as in the restaurant after the woman has gained 300 lbs.

Select 4 teams of role plays to do their impromptu visit in the restaurant. Pick up on students discomfort with over-weight and note ways that the man may help the woman lose weight.

OTHER ACTIVITIES

VII. Examine your own eating habits, by studying the context of your eating, by keeping a log over a 1-week period, of:

A. With whom do you eat?	alone others (who)
B. Frequency of eating.	less than 3 times a day 3 times more then 3 times a day
C. Where do you eat?	at home? which room? street restaurant school
D. Mood while eating	happy sad Bored tense

VIII. Read the following sections of Berton Roueche's "Eleven Blue Men: and Other Narratives of Medical Detection":

Pigs From New Jersey	pp. 7-18
Eleven Blue Men	pp. 73-90
Family Reunion	pp. 159-172

THE LUNCHEON

by W. Somerset Maugham

To what lengths will a man not go to sustain a flattering self-image? The teller of this amusing story learned, on a single occasion, more about himself than he wanted to know.

I caught sight of her at the play, and in answer to her beckoning, I went over during the interval and sat down beside her. It was long since I had last seen her and if someone had not mentioned her name I hardly think I would have recognized her. She addressed me brightly.

"Well, it's many years since we first met. How time does fly! We're none of us getting any younger. Do you remember the first time I saw you? You asked me to luncheon."

Did I remember?

It was twenty years ago and I was living in Paris. I had a tiny apartment in the Latin Quarter overlooking a cemetery and I was earning barely enough money to keep body and soul together. She had read a book of mine and had written to tell me about it. I answered, thanking her, and presently I received from her another letter saying that she was passing through Paris and would like to have a chat with me, but her time was limited and the only free moment she had was on the following Thursday; she was spending the morning at the Luxembourg and would I give her a little luncheon at Foyot's afterwards? Foyot's is a restaurant at which the French senators eat and it was so far beyond my means that I had never even thought of going there. But I was flattered and I was too young to have learned to say no to a woman. (Few men, I may add, learn this until they are too old to make it of any consequence to a woman what they say.) I had eighty francs (gold francs) to last me the rest of the month, and a modest luncheon should not cost more than fifteen. If I cut out coffee for the next two weeks, I could manage well enough.

I answered that I would meet my friend--by correspondence--at Foyot's on Thursday at half-past twelve. She was not so young as I had expected and in appearance imposing rather than attractive. She was in fact a woman of forty (a charming age, but not one that excites a sudden and devastating passion at first sight), and she gave me the impression of having more teeth, white and large and even, than were necessary for practical purpose. She was talkative, but since she seemed inclined to talk about me I was prepared to be an attentive listener.

I was startled when the bill of fare was brought, for the prices were a great deal higher than I had anticipated. But she reassured me.

"I never eat more than one thing. I think people eat far too much nowadays. A little fish, perhaps. I wonder if they have any salmon."

Well, it was early in the year for salmon and it was not on the bill of fare, but I asked the waiter if there was any. Yes, a beautiful salmon had just come in, it was the first they had had. I ordered it for my guest. The waiter asked her if she would have something while it was being cooked.

"No," she answered. I never eat more than one thing. Unless you have a little caviar. I never mind caviar."

My heart sank a little. I knew I could not afford caviar, but I could not very well tell her that. I told the waiter by all means to bring caviar. For myself I chose the cheapest dish on the menu and that was mutton chop.

"I think you're unwise to eat meat," she said. "I don't know how you can expect to work after eating heavy things like chops. I don't believe in overloading my stomach."

Then came the question of drink.

"I never drink anything for luncheon," she said.

"Neither do I," I answered promptly.

"Except white wine," she proceeded as though I had not spoken. "These French white wines are so light. They're wonderful for the digestion."

"What would you like?" I asked, hospitable still, but not exactly effusive.

She gave me a bright and amicable flash of her white teeth.

"My doctor won't let me drink anything but champagne."

I fancy I turned a trifle pale. I ordered half a bottle. I mentioned casually that my doctor had absolutely forbidden me to drink champagne.

"What are you going to drink, then?"

"Water."

She ate the caviar and she ate the salmon. She talked gaily of art and literature and music. But I wondered what the bill would come to. When my mutton chop arrived, she took me quite seriously to task.

"I see that you're in the habit of eating a heavy luncheon. I'm sure it's a mistake. Why don't you follow my example, and just eat one thing? I'm sure you'd feel ever so much better for it."

"I am only going to eat one thing," I said, as the waiter came again with the bill of fare.

She waved him aside with an airy gesture.

"No, no, I never eat anything for luncheon. Just a bite, I never want more than that and I eat that more as an excuse for conversation than anything else. I couldn't possibly eat anything more--unless they have some of those giant asparagus. I should be sorry to leave Paris without having some of them."

My heart sank. I had seen them in the shops and I knew that they were horribly expensive. My mouth had often watered at the sight of them.

"Madame wants to know if you have any of those giant asparagus," I asked the waiter.

I tried with all my might to will him to say no. A happy smile spread over his broad, priestlike face, and he assured me that they had some so large, so splendid, so tender, that it was a marvel.

"I'm not in the least hungry," my guest sighed, "but if you insist, I don't mind having some asparagus."

I ordered them.

"Aren't you going to have any?"

"No, I never eat asparagus."

"I know there are people who don't like them. The fact is, you ruin your palate by all the meat you eat."

We waited for the asparagus to be cooked. Panic seized me. It was not a question now how much money I should have left over for the rest of the month, but whether I had enough to pay the bill. It would be mortifying to find myself ten francs short and be obliged to borrow from my guest. I could not bring myself to do that. I knew exactly how much I had, if the bill came to more, I made up my mind that I would put my hand in my pocket and with a dramatic cry start up and say it had been picked. Of course it would be awkward if she had not enough money either to pay the bill. Then the only thing would be to leave my watch and say I would come back and pay later.

The asparagus appeared. They were enormous, succulent, and appetizing. The smell of the melted butter tickled my nostrils as the nostrils of Jehovah were tickled by the burnt offerings of the virtuous Semite. I watched the abandoned woman thrust them down her throat in large voluptuous mouthfuls and in my polite way I discoursed on the condition of the drama in the Balkans. At last she finished.

"Coffee?" I said.

"Yes, just an ice cream and coffee," she answered.

I was past caring now, so I ordered coffee for myself and an ice cream and coffee for her.

"You know, there's one thing I thoroughly believe in," she said, as she ate the ice cream. "One should always get up from a meal feeling one could eat a little more."

"Are you still hungry?" I asked faintly.

"Oh, no, I'm not hungry you see, I don't eat luncheon. I have a cup of coffee in the morning and then dinner, but I never eat more than one thing for luncheon. I was speaking for you."

"Oh, I see!"

Then a terrible thing happened. While we were waiting for the coffee, the head waiter, with an ingratiating smile on his false face, came up to us bearing a large basket full of huge peaches. They had the blush of an innocent girl; they had the rich tone of an Italian landscape. But surely peaches were not in season then? Lord knew what they cost. I knew too--a little later--for my guest, going on with her conversation, absent-mindedly took one.

"You see, you've filled your stomach with a lot of meat"--my one miserly little chop--"and you can't eat any more. But I've just had a snack and I shall enjoy a peach."

The bill came and when I paid it I found that I had only enough for a quite inadequate tip. Her eyes rested for an instant on the three francs I left for the waiter and I knew that she thought me mean. But when I walked out of the restaurant I had the whole month before me and not a penny in my pocket.

"Follow my example," she said as we shook hands, "and never eat more than one thing for luncheon."

"I'll do better than that," I retorted. "I'll eat nothing for dinner tonight."

"Humorist!" she cried gaily, jumping into a cab. "You're quite a humorist!"

But I have had my revenge at last. I do not believe that I am a vindictive man, but when the immortal gods take a hand in the matter it is pardonable to observe the result with complacency. Today she weighs three hundred pounds.

TEACHER NOTES for
ACTIVITY IV-1-A-1

"The Luncheon"

PART V. Lead a discussion among the class, speculating as to other reasons why the woman ate so much and became fat. Discuss:

psychological

economic

social

cultural/ethnic

health

PART VIII. Lead a discussion on the readings and/or assign other activities, i.e. write a report on one of the three.

ACTIVITY IV - I-C

It has been said that " a man's castle is his home". In many places in the City nothing could be further from the truth.

Imagine that you are your parent:

I. Write a 150-200 word letter to the eidtor of your local newspaper on the housing issues suggested in the above statement.

II. Many of our attitudes and feelings are related to where we live and the conditions within which we live. This activity will help you look at your housing situation.

Take this survey yourself.

A. How would you describe the overall condition of:

1. your neighborhood?	Excellent	Good	Fair	Poor
2. your block?	Excellent	Good	Fair	Poor
3. your building?	Excellent	Good	Fair	Poor
4. your apartment?	Excellent	Good	Fair	Poor

B. What are the major improvements needed to make your block and neighborhood a better place in which to live? (Check all the boxes that apply.)

	very important	somewhat important	negligible	not at all important
1. better police protection				
2. better sanitation services				
3. better quality of housing				
4. more open space (parks, sitting areas)				
5. more recreation space (playgrounds)				
6. larger number and variety of stores				
7. more community activities				
8. other(s) ______ ______				

(continued)

C. Everyone has different reasons for choosing a place to live. Which of the following characteristics make this neighborhood a good place to live for you? (Check all boxes that apply.)

	major reason	somewhat important	minor reason	not a reason
1. convenient shopping				
2. good transportation				
3. access to cultural/ intellectual events				
4. moderate rents				
5. withingwalking distance of school or job				
6. nearby churches, synagoges, temples				
7. diverse community				
8. sense of community created by the small size and character of buildings				
9. other(s) ____________ ____________				

D. What are the most important problems in your building, if any? (Check all boxes that apply.)

	very important	somewhat important	not at all important
1. none			
2. faulty plumbing			
3. faulty wiring			
4. lack of security			
5. faulty elevator			
6. no elevator			
7. lack of heat and hot water			
8. poor management			
9. hallways and lobby dirty			
10. roof leaks			
11. poor maintenance			
12. other(s) ____________ ____________			

(continued)

E. What are the most important problems in your apartment, if any? (Check all boxes that apply.)

	very important	somewhat important	not at all important
1. none	☐	☐	☐
2. rooms laid out badly	☐	☐	☐
3. inadequate heat	☐	☐	☐
4. old, deteriorated windows	☐	☐	☐
5. cracked and broken plaster	☐	☐	☐
6. flooring problems	☐	☐	☐
7. faulty or inadequate wiring	☐	☐	☐
8. poor or inadequate kitchen	☐	☐	☐
9. poor or inadequate bathroom	☐	☐	☐
10. low water pressure	☐	☐	☐
11. faulty plumbing	☐	☐	☐
12. roach or mice infestation	☐	☐	☐

III. Now take the survey home and ask your parent (or head of household) to complete it.

IV. A. In class, tabulate student data (impressions) and then tabulate parent data.

B. Discuss differences between parent and student perception on similar survey items and in the overall outcome of the data.

C. Write a 200 word statement as to why you think parents (heads of households) see the housing situation differently from their teenaged children.

V. Make a schematic drawing of the floorplan of your house. Show the different people's special (personal) space and shared space. Also indicate, with a number (1, 2, etc.) any place in the floor plan where there is a health hazard. On a separate piece of paper, list all numbers with an explanation of what hazard exists there.

VI. A. Get construction materials from your teacher and begin to redesign (or start from a whole new concept) the kind of housing that you want. Limit this project to the internal design of space.

B. Give a short oral report to the class demonstrating how your design has improved the living conditions in your home.

C. Go over the design with your parents (head of household) and get their response. Write it up.

D. What would it cost per month to live in your newly designed home/apartment?

TEACHER NOTES for
Activity IV-I-C

Part VI. This section can be jointly taught with an art or social studies teacher.

VI-B. This may be done as a 200 word report, instead of orally.

VI-E. Try to have an architect from a New York City (Board of Education) Agency come to meet with the students and to respond to their constructions/designs.

ACTIVITY IV-1-C-1

Burning Cloth I

1. Bring in a number of small pieces of cloth from your house.
2. Label each piece as either wearing apparel or household (e.g. curtain, bed clothes, etc.)
3. Cut the pieces of cloth all the same size so they fit easily on a large watch glass. Set up your observation sheet as shown below:

Sample #	1	2	3	4	5
Use					
Describe each sample of cloth: color, texture, content of material if you have the label.					
Describe how each material burns: flames, smolders					
Time it took for the material to be completely burned					

4. Place each sample on a watch glass labeled 1-5 for each of your samples.
5. When you are ready, ask the teacher for a match and a stop watch. Have one member of your team light the material. At the same time, have another member of the team begin the stop watch. When there is no more glow, stop the clock and record the time. Do this for each sample.

Burning Cloth II

On the basis of your observations of burning cloth, answer the following questions:

1. Which fabric burned the fastest? Describe the time, and how much faster it was to the 2nd fastest burning material. What was the type of fabric and what was it originally used for?

(continued)

2. Was there a fabric that would not burn at all? What is it used for?

3. Were most of your fabrics fast or slow burning? What might this tell you about clothes/fabrics that are brought in your household.

4. Where are the rags stored in your house? Based on what you found in this exercise, what recommendations would you make to homemakers about storage of fabrics?

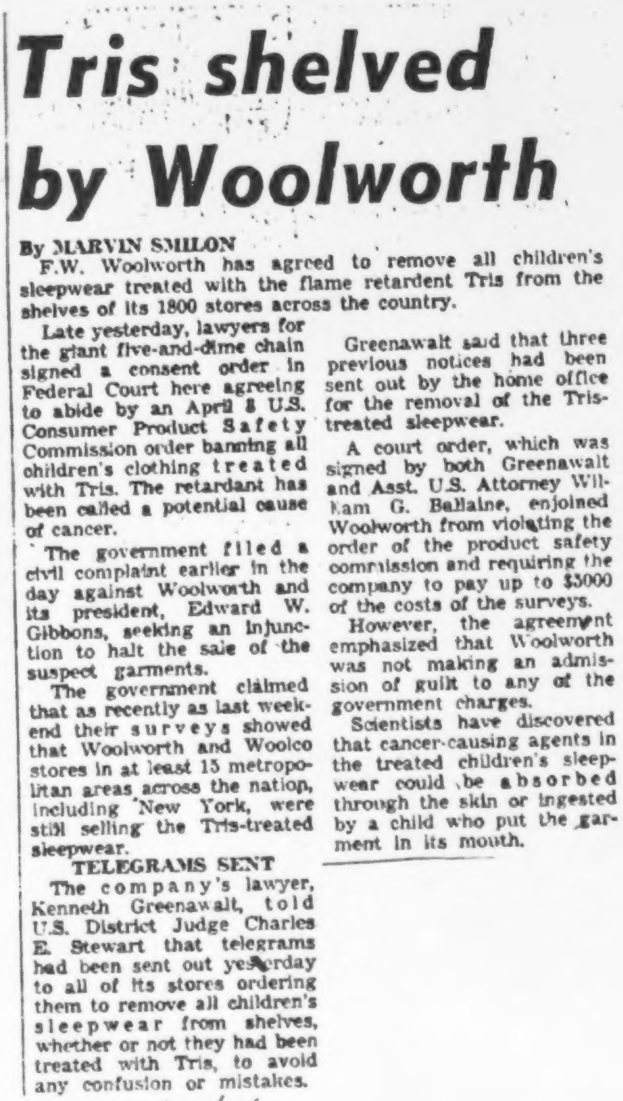
5. What consumer health hazards would you say are related to the types of materials used to make fabric you use?

6. On the basis of your observations, what consumer protection recommendations would you make. List them.

ACTIVITY IV-I-C-2

Clothes can be dangerous to your health!

1. Does this title sound absurd to you? Read the article below about "TRIS", the flame retardant on children's sleepwear.



Tris shelved by Woolworth

By MARVIN SMILON

F.W. Woolworth has agreed to remove all children's sleepwear treated with the flame retardent Tris from the shelves of its 1800 stores across the country.

Late yesterday, lawyers for the giant five-and-dime chain signed a consent order in Federal Court here agreeing to abide by an April 8 U.S. Consumer Product Safety Commission order banning all children's clothing treated with Tris. The retardant has been called a potential cause of cancer.

The government filed a civil complaint earlier in the day against Woolworth and its president, Edward W. Gibbons, seeking an injunction to halt the sale of the suspect garments.

The government claimed that as recently as last weekend their surveys showed that Woolworth and Woolco stores in at least 15 metropolitan areas across the nation, including New York, were still selling the Tris-treated sleepwear.

TELEGRAMS SENT

The company's lawyer, Kenneth Greenawalt, told U.S. District Judge Charles E. Stewart that telegrams had been sent out yesterday to all of its stores ordering them to remove all children's sleepwear from shelves, whether or not they had been treated with Tris, to avoid any confusion or mistakes.

Greenawalt said that three previous notices had been sent out by the home office for the removal of the Tris-treated sleepwear.

A court order, which was signed by both Greenawalt and Asst. U.S. Attorney William G. Ballaine, enjoined Woolworth from violating the order of the product safety commission and requiring the company to pay up to $3000 of the costs of the surveys.

However, the agreement emphasized that Woolworth was not making an admission of guilt to any of the government charges.

Scientists have discovered that cancer-causing agents in the treated children's sleepwear could be absorbed through the skin or ingested by a child who put the garment in its mouth.

NY Post 5/18/77

2. Which store carried the clothes treated with TRIS?

3. Describe the scientific reason why TRIS was ordered to be removed from the stores.

(continued)

4. Which agency ordered the removal of the garments from the shelves?

5. Why do you suppose that people in the neighborhood did not organize a group to demand the removal of TRIS-treated products from the shelves? Explain your answer.

6. How many parents do you think bought children's garments treated with TRIS?

7. How many children in your neighborhood do you think are wearing pajamas treated with TRIS?

Clothes Can Be Dangerous To Your Health!- II

Investigating TRIS

1. Background. (TEACHER)

2. If TRIS is dangerous to children who wear the treated cloth, is it not also dangerous to the people who make and use the chemical?

   a) Find out where TRIS is manufactured by calling Dr. Arthur H. Rohl, at the Environmental Science Laboratory, Mt. Sinai Medical Center.

(continued)

b) Call the plant/or plants and find out how many workers come into contact with the chemical material.

c) Write a citizen's letter to the president of the plant telling what you think about them employing people to work in hazardous conditions.

d) Write to the local unions at the plants producing TRIS. Ask for an explanation as to why they allow their memebers to work in hazardous health conditions.

3. Survey 3 to 4 Woolworth or Woolco stores in your neighborhood to see if there are any children's garments, treated with TRIS, on the shelves.

4. If you see some TRUS-treated garments on the shelves, purchase one from the store and keep the receipt. Prepare a written report of your TRIS survey to be read in class.

5. Prepare a follow-up project for informing Woolworth's, local and federal agencies, and the local newspapers, about any TRIS-treated materials that were purchased at the stores. Inform the newspapers by holding a press conference at your school.

Other Apparel That May Be Dangerous To Your Health!

A Survey

How many people do you know who wear "junk" jewelry? Do any of them get rashes, itching or swelling around the body area where the jewelry is worn? Isadora Duncan, a famous dancer of the 1930's, died when the very long scarf she was wearing in an open convertible car was caught by a car passing in the opposite direction, breaking her neck. In this case, the style of clothes worn by Miss Dincan was very dangerous to her health.

A. Do a survey in your block to find out how many people wear things that are uncomfortable and/or are actually causing health problems.

Survey qestions:

1. Sex: M F

Age Group: 1-6 6-12 13-20 21-44 44+

Address:

2. Do you wear panty hose regularly? Yes No

Do you have gynecological problems that you see a doctor for? Yes No

(continued)

3. Do you wear platform shoes regularly? Yes No

   Do you have a problem with feet, ankles, or back? Yes No

   Do you now, or did you ever, see a doctor about the problem? Yes No

4. Do you wear "junk" jewelry regularly? Yes No

   Do you have itching, or swelling, or a rash in that area? Yes No

   Are you now or have you ever had the rash or swelling treated by a doctor? Yes No

5. Do you wear vinyl (plastic) clothes regularly? Yes No

   For how many years have you worn plastic materials? ____________

   Are you aware of the cancer causing potential of plastic? Yes NO

6. Why do you wear the apparel listed above? Write down the reasons given.

B. Do the same survey in a neighborhood very different from yours. Compare your findings in each neighborhood.

1. Is there a different pattern of use of these apparel in different neighborhoods?

2. In your judgment, how important are the following factors in determining people's use of potentially hazardous apparel? Comment with an explanation based on the survey:

   a) income

   b) age groups

   c) sex

   d) cultural/ethnic background

TEACHER NOTES for
ACTIVITY IV-1-D-1 & 2

Discuss the energy "crisis". Have the class collect and read articles from the newspaper 2 weeks or so before and after the activity is given.

Further Activities:

1. Organize a debate: For and against Solar Energy. Include political, economic, and environmental issues.
2. Find out what would be involved with using solar energy for your school, class, home, building, etc. Write up a plan of action.

ACTIVITY IV-I-E-1

In this activity, you will investigate the use of public and private transportation in the neighborhood. You will try to find out how often public and private vehicular traffic travels past a particular point from which you are making observations.

1. You will work with 2 classmates. Select a street corner, with a traffic light, near the hospital. Make a 15-minute observation. One person is the recorder; one, counts 8- and 6-wheeled vehicles; the third, counts 4- and 2-wheeled vehicles.

2. Outline a data collection sheet, like the one below. Go out to the corner with your team. Do this on 3-4 days.

A. Observers names: Date ______________

1) ____________________

2) ____________________

3) ____________________

B. Location: Street ______________ Avenue ____________________

C. Time observation began: ________________, ended: ____________________

D. Vehicle information:

8-wheeled	6-wheeled	4-wheeled	2-wheeled

In a follow-up study, use the same procedures A, B, and C, but skip D. Instead of D use E.

E. Vehicle information:

Public Transportation		Trucks & Vans	Cars
Cabs	Buses		

Find out for each study, D and E:

1) What was the average number of vehicles which passed your observation point?

2) What was the frequency of each type of vehicle passing your observation point?

(continued)

3. Make a bar graph to show the frequency of each type of vehicle that passed your observation point.

4. In a few sentences, tell what your data shows.

5. Get together with a group which was at a different observation point. In a few sentences, tell what the differences and similarities in your data are.

6. Discuss different daily patterns of your data.

7. Discuss patterns of 3 different observation points.

8. On the basis of what your studies show explain how people's consuming behavior may affect the quality of air and noise level in your neighborhood.

TEACHER NOTES FOR
ACTIVITY IV-I-E-I

You may find it valuable to summarize all group data in one frequency distribution and graph. The class can respond to the over-all data.

ACTIVITY IV-I-F

Cosmetic Quackery

INTRODUCTION:

In a 1972 survey by the Food and Drug Administration, 34% of the people questioned, replied that cosmetics and toiletiies were perfectly safe. About 42% of the people questioned didn't "worry at all" about cosmetic and toiletry safety. Write down how you feel about this now, and again after doing the activities listed below.

A. Read pp. 142-145 on "Cosmetics" in Consumer Health, Harold J. Cornacchia.

1. Write down a list of cosmetics you use. How often do you use them?

2. What are some possible health hazards?

3. List at least 5 ways you can protect your health and budget by carefully selecting cosmetics.

(continued)

A. 4. Define:

therapeutic

cosmetic

allergic

pseudoscientific

subcutaneous tissue

degeneration

rejuvenating

contamination

(continued)

B. What comes in a tube and contains castor oils, fats, lanolin, carnauba wax, bees wax, perfume, and dye? Give up? - Lipstick!

Ever see these ingredients listed on a label? Probably not.

Read "FDA Says Cosmetics Must List Contents" and answer the following questions:

1. What is the FDA?

2. Why do manufacturers say they don't want to list ingredients?

3. Why does the FDA want to list ingredients?

4. What are the regulations involved in putting a new cosmetic on the market?

C. Go to a drugstore or a store with a cosmetic section.

1. List those items that have ingredients listed on the label (since there will be items on the shelf put there before the regulation May 1975 will be enforced).

2. What does the product say it will do?

(continued)

3. What is the ingredient that will achieve this purpose (e.g. the dye ingredient of lipstick which is 4-8% of the total ingredients **affects** lip color).

D. Homework:

When watching TV, note how many ads are for cosmetics. Write down what the ad says the product will do for the user. If possible, find out the ingredients. Does the ad say anything about cosmetic safety?

F.D.A. SAYS COSMETICS MUST LIST CONTENTS

NYTIMES Wed. April 13, 77

Beauty and Cleansing Aids Are Affected — Critics Say Order Ignores Product Safety

By NANCY HICKS

Special to The New York Times

WASHINGTON, April 12—Following a two-year legal battle, the Food and Drug Administration will begin Friday requiring the nation's cosmetics manufacturers to list the ingredients of their beauty and cleansing products.

Despite assertions by manufacturers in the $6.5 billion industry that such listings could prove cumbersome and could release trade secrets, the United States Court of Appeals in Washington has told the agency that it can enforce the regulation, first formally proposed in May 1975.

So the F.D.A. announced today that manufacturers must begin listing in decreasing order of volume the chemicals contained in their products. To protect trade secrets, manufacturers are allowed to list "fragrances" and "flavors" as such, without stating the chemical composition.

While the new labeling requirement will help the consumer in selecting products, critics of the cosmetics industry say that it fails to deal with the more serious concern of product safety. Citing such examples as cleansing compounds, they say that the posnible effect on the body of a number of chemicals is unknown. Substances presumed safe during years of use, for example, have been found to be harmful.

F.D.A. Power Limited

The Food and Drug Administration has authority only to remove from the market cosmetic preparations that are found to be "adulterated or misbranded." But the agency has the burden of proof, and there is no requirement under law that manufacturers submit safety data to the agency, said Heinz Eiermann, who heads the F.D.A.'s cosmetics division.

This month, Senator Thomas F. Eagleton, Democrat of Missouri, will introduce for the third time a bill that would bring the cosmetics industry under stricter Federal control. But advocates of stronger regulation say that apathy, industry pressure and the lack of a clear understanding of how to protect the consumer mean that again the bill has little chance of passage.

There is now no requirement that manufacturers register their products, their formulations or their laboratories, Mr. Eierman said, and his inspectors can look only at the cleanliness of the operation and not the work that goes on.

In addition to the new labeling requirement, the F.D.A. is also planning to enforce another regulation requiring manufacturers who are not conducting "adequate" safety testing to label their products: "Warning: the safety of this product has not been tested."

But Mr. Eiermann points out that since manufacturers are not required to show their safety testing data, the regulation is unenforceable.

Eagleton Proposal

The Eagleton bill would require each manufacturer to establish, before marketing, the safety of each cosmetic and to turn testing data over to the F.D.A. upon request. The legislation passed the Senate by voice vote in 1975 but was never taken up in the House.

Representative Paul Rogers, Democrat of Florida, who heads the Commerce Committee's health subcommittee, has said that the most he would do this year is initiate legislation to set up a commission within the Department of Health, Education and Welfare to study the problem.

"We've looked at the Senate's hearings for 1974 and 1975," said a Rogers assistant, "and they contain nothing that suggests there are health consequences that require immediate action." She added, "Until we get that we wouldn't want to legislate."

The manufacturers, pleased with that attitude, point to a record showing 15,700 complaints a year about adverse reactions to cosmetics, when 6 billion units are sold annually.

Anita Johnson of the Nader Health Research Group, which regards the Eagleton bill as useless, had harsh criticism for the Congress record on the matter. "Until someone else on the Hill shows leadership, cosmetics are going to go unregulated, as usual," she said. "Putting a new cosmetic product on the market is as easy as selling a new paper clip. All you have to do is find someone who will buy it," she said.

The adverse reactions can be far more serious than rashes, according to Miss Johnson and Mr. Eiermann. There is increased understanding, they say, that chemicals applied to the skin in lotions, for example, are absorbed and wind up in the bloodstream.

In 1972, hexachlorophene, long used as an antibacterial cleansing agent for babies and in hospitals, was found to accumulate in the body and cause brain damage. Its use was then restricted.

Similarly, the next year the F.D.A. banned the use of vinyl chloride, widely used as a propellant in hair spray because it was linked to liver disease.

cial Application to Cancer; and *A New Approach to the Etiology, Diagnosis, Treatment and Prevention of Some of the Degenerative Diseases including Therapeutic Biochemistry.* During the same period these seven books covering unproven cancer remedies in general were published: *The Long Search for the Truth about Cancer, The Cancer Blackout, Cancer Cures, Victory Over Cancer, People's Cancer Handbook, Cancer Facts and Fallacies,* and *Cancer Cures Crucified.*

All of the above books have been skillfully written and cause the average reader to conclude that he himself can make valid judgments about favorable cancer treatments. The reader is given the impression that the author is impartial and factual, despite the fact that the book may strongly advocate a particular method of treatment.

3. Magazines. A variety of so-called health magazines have appeared on the market, including:
    a. *Herald of Health* (6,800 subscribers) proclaims the values of "natural foods" grown in "living organic soil." It frequently contains articles on unproven methods of treating cancer.
    b. *National Health Federation Bulletin.*
    c. *Prevention* (830,000 subscribers in 1971) is put out by the same publisher as *Organic Gardening* and the *Rodale Health Bulletin.*
    d. *Cancer News Journal* contains information about nontoxic cancer therapies and diagnostic tests.
4. Radio and television. Proponents of controversial remedies are frequently interviewed. Some individuals, such as Harry M. Hoxsey, have had their own radio stations.
5. Health Organizations
    a. National Health Federation (10,000 members) frequently expresses its distastes for the medical monopoly and advocates the right of people to be able to exercise personal choice and individual freedom in regard to health matters.
    b. Independent Citizens Research Foundation for the Study of Degenerative Diseases, Inc. is a group that has been organized to help cancer victims without hope. It has distributed bulletins on unproven cancer remedies such as Krebiozen, the Gerson Method, and the Wachtel Method.
    c. International Association of Cancer Victims and Friends, Inc. is an organization started by a woman now deceased from cancer. She was a cancer victim who believed her life was saved by Laetrile. Some have stated that its purpose may be to organize people to go to Mexico for treatment.
6. Sponsorship by prominent individuals. Senator William Langer (deceased) actively sponsored the Hoxsey method, Koch Antitoxins, Spears Chiropractic, and Krebiozen. On the floor of the U.S. Senate, Senator Charles W. Tobey (deceased) praised the use of Lincoln bacteriophage in a speech was published in the *Congressional Record.* Senator Paul Douglas was a consistent sponsor of Krebiozen.

COSMETICS AND SKIN

Cosmetics are defined by federal law under the Food, Drug and Cosmetic Act as substances intended to be rubbed, poured, sprinkled, or sprayed on the body to cleanse, beautify, promote attractiveness, or alter appearance, whereas drugs are said to be products that make therapeutic claims on labels to alter body functions. It should be obvious that both cosmetics and drugs affect the skin and may sometimes overlap in terms of functions. This complexity frequently makes it impossible to identify clear distinctions. Therefore no attempt will be made to show differences in the information that follows.

Most cosmetics are safe for most individuals. Dr. Rees B. Rees,[25] Department of Dermatology, University of California Medical Center, has stated that cosmetics are more beneficial than harmful. He adds they protect the skin and are remarkably safe due to the inert ingredients contained. However, some people are allergic to cosmetics as well as to drugs, while others may misuse and abuse these products.

It is estimated that the cosmetic industry exceeds $5 billion in sales per year. In their eagerness to continually expand their volume of business, many cosmetic drug manufacturers have tended to seize upon pseudoscientific data to promote products and on occasion to make unsubstantiated claims regarding the materials advertised.

It should be noted that among the new regulations issued by the Food and Drug Administration in regard to cosmetics it is required that ingredients be listed on all cosmetic labels by January 1, 1976. The substances shall be listed in the order of predominance, with the ingredient present in the largest amount listed first, and so on down. Among other things, this action should enable allergic individuals to identify and avoid irritating materials.

The pages that follow should enable the reader to better understand the nature of a variety of the cosmetic and skin products available.

Cosmetics

Soap and water act upon the skin surface to loosen and remove soil and grime, body secretions, skin cell debris, microorganisms, and the many substances applied to it by design such as cosmetics, toiletries, and medications. General rules for washing the skin are:

1. Avoid using very hot water and scrubbing with strong soap because these cause excessive degreasing of the skin and subsequent dryness, chapping, and itching. Use soft water when possible.
2. Do not massage soap into your skin unless advised to do so by your physician for a specific reason.
3. Do not use medicated soaps unless advised to do so by your physician. The potential harm outweighs the benefits, because of allergic reaction and photosensitivity possibilities. Hexachlorophene has been removed from most soaps.
4. Use sufficient water to rinse away all traces of soap.
5. If you have oily skin, wash your face with soap and water frequently instead of using cleansing cream. You may wish to follow with a cold water wash.
6. If you have dry skin, use soap and water and alternate with cleansing cream. Use a bland soap and pat your face dry with a towel.
7. Avoid too frequent bathing, especially during the winter, since this can dry and irritate the skin.

Margolius stated:

> All you can expect from a so-called skin cream is that it will remove surface dirt and makeup and will temporarily soften dry skin when that dryness is caused by external conditions. All you need for that latter purpose is cold cream.[19]

Cold creams generally contain mineral oil (50%), beeswax (15%), soap emulsifier (2%), water (33%), and added fragrance to cleanse and soften skin. Some use vegetable oil, lanolin, glycerin and others to improve moisture retention. Cleansing creams are the same as cold creams to which other ingredients such as alcohol have been added for evaporative purposes.

Smith claimed:

> There are no miracles in nonprescription preparations for the skin, no matter how high priced. Some of the products sold without prescriptions may contain a little estrogen or another of the wonder elements, but there is little evidence to support the supposition that these preparations are better for your skin than without the added ingredient at present there is no obvious, discernible advantage in organic or health preparations made with natural ingredients over other well-made products secret ingredients ballyhooed at one time or another to provide "beauty in a bottle" include avocado, estrogen, turtle oil, queen bee jelly, vitamin E (and other vitamins), milk, honey you name it scientists have not found any clinical evidence to support the direct or implied promises that any such elements, as combined in the products, are absorbed by the skin.[20]

There is no evidence by medical authorities to support claims of special beneficial properties of any of these ingredients. These additional comments about skin creams should receive consideration:

1. Preparations labeled "hypoallergenic" are not necessarily nonallergenic. Some people will have reactions.
2. Claims that soaps or other products are "pure" may be advertising or promotional puffery.
3. Cosmetics may be helpful, but they cannot perform miracles, and people may be disappointed in claims of instant face-lifts, cream masks, cream peels, and other items to help you look younger.
4. Cream peels contain resorcinol, an irritant that causes mild skin swelling. This reduces the number of wrinkles but only for a few days. The mild redness caused by the irritating chemical gives skin a pink appearance. Resorcinol use in cosmetics is limited and questionable. Dermatologists can use the substance effectively in therapy.
5. Bleaching cremes used for freckles, flat moles, and so-called liver spots are able to produce some lightening of skin pigmentation. They may contain ammoniated mercury or hydroquinone, both of which may cause allergic reactions. It may be advisable to apply a small amount to one's skin and leave the substance on for 24 to 48 hours to determine sensitivity.

Aging skin and wrinkles

Aging and wrinkling are irreversible processes of the skin and the subcutaneous tissue. They result from a degeneration of elastic tissue, a loss of subcutaneous fat, and a loss of fluid content.

The American Medical Association stated:

> Beware of advertisements which promise (directly or indirectly) that a certain creme will remove wrinkles or restore youthful beauty. There is no cream . . . that will safely and effectively remove wrinkles. . . . Products containing . . . royal jelly, placental extract . . . natural proteins, polyunsaturates, or "secret formulas" . . . have not been scientifically proven to rejuvenate aged skin.[1]

So-called rejuvenating creams contain estrogen and progesterone, which are female hormones. These hormones are not significantly effective in improving aging skin or in preventing wrinkles. Facial masks, facial saunas, electric needles, vigorous massage, and an increase in the tonicity of facial muscles will not help prevent sagging or flabbiness of the skin. Some of the latter methods increase the blood flow in the skin, produce some swelling by increasing the amount of fluid in the tissues, and may have a positive psychological effect.

At best, cosmetic products and procedures provide minor and temporary appearance improvements. Appropriate cosmetic surgery (discussed later) performed by qualified surgeons may be the most rewarding approach to improving the appearance of the skin.

The Federal Trade Commission[15] recently accepted a consent order prohibiting Forever Young, Inc., of Denver, Colorado, from misrepresenting the safety and the results of a medical treatment to remove wrinkles and blemishes. The treatment involved the application of a chemical solution (containing phenol, or carbolic acid) that peels off the outer layer of the skin, producing an alteration in appearance as the skin heals. The FTC said the treatment was not safe as represented. The patient may be subject to systemic toxic reaction as well as hyposensitivity to phenol and some of its derivatives. Phenol is toxic to the kidneys, liver, and other organs of the body when present in sufficient quantities and enough can be absorbed through the skin during the treatment to cause serious or fatal illness in some people. One patient allegedly died from this cause during the Forever Young treatment.

The FTC also charged that the advertising by the Forever Young Company did not mention pain or discomfort. Actually, the pain could be so severe that patients would always be sedated or anesthetized during the application. They may require medication for days, weeks, or months afterward to reduce pain and other discomforts.

Cosmetic safety

The hazard to the consumer from exposure to cosmetics is not fully known. It is possible that this hazard may be great. However, in 1971, only 256 complaints were received by the FDA from individuals

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who believed they were adversely affected, and in 1970 there were 228 complaints.

A number of cosmetic products show unacceptable levels of microbacterial contamination. The extent of microbial control used in production varies with manufacturers, since there are no government standards promulgated that products must meet. To combat the growth of microorganisms, manufacturers use preservatives that could be toxic to humans. These preservatives include mercuric compounds, hexachlorophene, and formaldehyde. It has been found that as little as 0.01% of formaldehyde can cause a skin reaction. The toxicological hazard of mercury externally applied has not been resolved.

The danger of self-contamination of eye shadow, mascara, eye lotion, eye drops, and the increased use of contact lenses all present possible hazards. Eye infections, some of a serious nature, have been known to develop.

The Food and Drug Administration[13] suggests the consideration of these safety rules when using cosmetics:

1. Read the labels carefully and follow directions exactly. This is especially important when using antiperspirants, depilatory (hair-removing) preparations, hair dyes, home permanents, and skin packs.
2. To determine whether you are allergic to a cosmetic, apply a small amount on the inside of your forearm and leave for 24 hours. Do not use the substance if redness or blisters appear.
3. If a cosmetic causes an adverse effect such as burning, breaking out, stinging, or itching, stop using it immediately. See your physician if the condition appears to be serious.
4. To prevent contamination wash your hands before applying a cosmetic.
5. To prevent contamination close containers after each use.
6. Do not borrow cosmetics from others.
7. When water is added to a cosmetic before use (cake eyeliner), the application of saliva may add germs to the product; water is safer.
8. No product is foolproof against allergies. No product is truly nonallergenic.
9. Medicated cosmetics will not cure skin diseases. You should consult a physician.
10. Aerosol products should be used in well-ventilated rooms to avoid inhalation. They should be used as directed on the label.
11. Be extremely cautious when using cosmetics around the eyes.
12. Report adverse effects from cosmetics to the manufacturer and to the Food and Drug Administration as a public service.

Cosmetic surgery

Cosmetic surgery or esthetic surgery is that branch of plastic surgery used primarily to improve an individual's physical appearance and functioning by repairing and restoring damaged areas of the skin and to repair and remodel the face and other parts of the body. Plastic surgery refers to the repair, remodeling, or restoration of injured or defective tissue or body parts. It is also performed by opthalmologists (eyelid lifts and repair around the eyes), otolaryngologists (repair and reconstruction of fractures in the head and neck region), general surgeons, and dermatologists. The material presented here will be confined to dermatological and plastic surgery by specialists.

Cosmetic surgery actually is a service and perhaps should have been included in Chapter 4 on medical care. However, because of its relationship to cosmetic products and procedures, it will be covered in this part of the book.

Plastic surgery

Cosmetic surgery includes these various procedures:

1. Face-lift (rhytidectomy)
2. Eyelid-lift (blepharoplasty)
3. Removing wrinkles, lines, bags, and sags in the lower face, cheek, and mouth area
4. Removing neck and skin lines, wrinkles, and grooves
5. Restructuring the skin, mouth and face, and reducing or enlarging the chin (mentoplasty)
6. Skin peeling (chemosurgery), and smoothing out of wrinkles

ACTIVITY IV-I-F-2

Medicine can be dangerous to your health!

I. The home medicine chest has been the cause of many health problems. Do you know of any health problems that are related to the medicine cabinet? Write a 100 word essay (composition) about the medicine cabinet.

II. Investigate the contents of your medicine cabinet (or wherever you store medicine). Make a survey, as per the chart below.

Brand Names	Use	Date of Prescription	Non-Prescription	Has Child-Proof Cap	Location Storage Area	Does Label Match the Content	Quantity
Bufferin	PainRelief	--	x	no	kitchen shelf	yes	about 50

III. On the basis of the information in your medicine cabinet survey, answer the following questions.

A. What medicine/material do you have the most of?

Name ______________________ Quantity ____________

B. What is the oldest medicine/material in your survey?

Date ____________ Age ____________

C. What is the least often used medicine? ______________________

D. What is the most often used medicine? ______________________

E. Which medicines have WARNING on them? List their names and what is written after the "warning".

(continued)

F. Which materials are labeled POISONOUS? List them.

G. Which medicines marked warning or poisonous are not fixed with a child-proof cap? List them.

IV. Exchange activity II with a classmate. Examine the results of their survey. On the basis of the survey you have "borrowed", write a short composition discussing the condition of health of the users of that medicine cabinet.

V. Read the attached article: Medicine: Handle With Care.

A. List 2 important pieces of advice that the article gives.

(continued)

B. Based on the article, what behaviors of yours, or of your family, should change, if any?

C. Give a definition of a drug.

D. Write a letter to your parents about safety with the medicine cabinet.

Medicine: Handle With Care

Shakespeare's advice about money—"neither a borrower, nor a lender be"—applies to prescription drugs as well. For more advice about handling medicines, not necessarily from the Bard, read on.

by Margaret Morrison

It's 3:00 a.m. You've awakened with a splitting headache. You grope your way into the bathroom without turning on the light (you *hope* to get back to sleep), reach for the bottle of aspirin that's always in the left corner of the medicine cabinet, gulp two tablets, and stumble back to bed.

You're going out of town for the weekend, you don't want to bother with that big bottle of capsules the doctor prescribed, so you pour half-a-dozen into a smaller container that another medicine had come in.

Some containers are too large for the medicine cabinet (like that douching formula, or the large bottle of rubbing alcohol), so you put them underneath the lavatory.

If you've ever done any of these things, you're guilty—along with millions of other American consumers—of mishandling medicines. And if you haven't suffered any unfortunate results from such mishandling, you're lucky.

Research and development of pharmaceutical products has resulted in a more abundant supply of medicines in the past few decades than ever before. We have medicines for the treatment of every type of health problem, from serious illnesses to minor symptoms. And how we handle them in our homes can be extremely important.

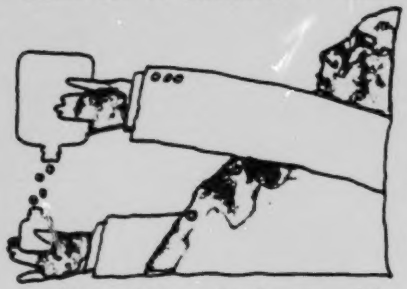
First, the matter of storing medicines. Some medicines have statements on their labels saying the product should be kept in a cool place, in which case you will probably refrigerate it. But most medicines are put in the medicine cabinet in the bathroom. In many homes, this is a small cabinet, only about a foot wide by two feet high by three inches deep. This is not normally enough space to hold all the medical products an average family might use, and consequently there is a spillover to vanity tops, bathroom shelves, kitchen cabinets and shelves, dresser drawers, or—with large containers—the area underneath the bathroom lavatory. Such a scattering of products can lead to problems.

This is especially true if there are young children in the home. Toddlers like to crawl and climb and get into things. And a bottle of medicine can look as inviting to them as a bottle of soda pop, a box of bright-colored pills as interesting as colored candy. And what toddlers can get to, they put in their mouths. Every year thousands of young children suffer accidental poisoning in their homes, because adults were careless about keeping medicines out of reach or locked up. In a home where there are young children, all medicines—as well as any other chemicals used in the home—should be kept on a high shelf out of the children's reach, or in a locked cabinet.

But this precaution alone is not enough. It is important, also, to practice safety rules when using medicines around children. For example, if you carry medicines in your handbag, and leave the bag on a chair or bed or other place a child can reach, you are inviting trouble. Young children love to explore pocketbooks, and they'll go for a cold tablet as well as a compact, or take the lid off a bottle of capsules as well as unscrew a lipstick.

Another reminder—if the phone or doorbell should ring when you're about to take (or have just taken) medicine, don't walk away and leave the medicine where a child can get it. It takes only a few seconds for a child to swallow medicine, and sometimes the consequences can be tragic.

To protect children from accidental use of medicines or other products that could be harmful, FDA, under the Poison Prevention Packaging Act, requires that all such products be enclosed in safety packaging. This means containers are designed to be especially difficult for children to open or medicines are encased in an individually wrapped package. This can help prevent accidental poisonings—but only if you make sure the safety closure on a product is securely refastened after each use.



Accidents involving medicines are by no means limited to children. Careless adults also are susceptible.

For example, take the practice of using medicine in the middle of the night, in an unlighted room. Even though the aspirin bottle may "always" have been in the left corner of the medicine cabinet, that is no guarantee it will be there every time you want it. Someone else may have needed medicine and may have moved the aspirin bottle and put in its place some medication for an entirely different symptom or condition. You could take the wrong medicine and end up with a serious reaction.

Another unwise practice is to take a prescription drug that was prescribed for someone else. The physician who prescribed medication for your friend or some other member of your family decided on the basis of a history, physical exam, or laboratory studies, to prescribe that particular medicine for that particular person.

Even though your symptoms may appear to you to be the same as the other person's, you may have a condition that is not the same—and which requires an entirely different medicine. Or you may have a health condition that makes the prescription inappropriate for you. Or you may be allergic to certain drugs—drugs the other person can take quite safely. In addition, the doctor will have no opportunity to tell you about necessary precautions or warn you of possible ill effects of the drug. When it comes to prescription medicines, "neither a borrower nor a lender be."

A related bad practice is keeping leftover medicines around for long periods after the condition they were prescribed for is gone. While this may be appropriate for some drugs (for example, antihistamines or analgesics) that are used intermittently for symptomatic treatment, it is a bad idea for medications intended for a specific illness (for example, antibiotics). First of all, even though your symptoms seem to you to be the same as when you first were given the drug, they may not be and the drug may not be appropriate. Second, many drugs lose potency with the passage of time, especially when their original containers are opened or when they are put into new containers, and the drug may no longer be effective. Old medicines should be destroyed.

Changing the container a medicine came in also is a dangerous practice. You may forget in a few days that you changed the container. You may think you're taking one kind of medicine, when you're taking something entirely different. And just as bad, you may take the proper medicine but take it incorrectly—since the directions for using it will remain on the original container.

Physicians and consumers are increasingly recognizing the important role the informed patient plays in the safe and effective use of drugs. It has often been demonstrated, for example, that many patients do not take medications according to the prescribed directions, thus decreasing the likelihood that they will benefit from them. The communication between patient and physician is the responsibility of both persons and in many cases it needs improvement. As a patient you can help by not being timid about asking your doctor such questions as:

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What is this supposed to do for me?

How long should I take it before checking with you again?

Are there any side effects I should watch for?

Is it all right to take this medicine along with other medicines I am taking?

When should I take this drug in relation to meals?

Are there any foods I should avoid?

Most doctors will welcome your interest and will be glad to answer your questions. And then it's up to you to follow his directions. For example, don't stop taking the medicine the moment you feel better. Take it as long as the doctor says you should—but no longer. And report any adverse reactions immediately.

In the case of nonprescription medicine, your responsibility is even greater. This is self-medication, and before you buy or use any nonprescription drug, you should learn all you can about it. What is it supposed to do? How long should you take it? What side effects could it cause? When should it *not* be taken? For example, some products will make you drowsy, so you should not use them if you plan to operate machinery or drive a car. Others should not be taken at the same time you're using certain other drugs. You will find this information, and more, if you take the time to read the label on the medicine and ask your pharmacist any questions you have that the label doesn't answer.

It is amazing how many people forget that alcohol is a drug and does not mix well with some medicines. The sedative effect, in particular, of drugs may be increased by use of alcohol. In this regard, sleeping pills and antihistamines are two kinds of drugs to be especially careful about. Whenever you're using medicine, it's a good idea to ask your physician or pharmacist whether it could be dangerous in combination with alcoholic drinks.

Margaret Morrison is a member of the FDA publications staff.

How Smart Are You About Medicines In Your Home?

Here's a checklist on your handling of medicines in the home and your personal practices in the use of medicines. The more "yes" answers you can check, the safer you and your home will be.

	Yes	No
1. Do you keep medicines in a cabinet which is not accessible to children?	☐	☐
2. Do you make sure the safety closure is securely refastened after you use a medicine?	☐	☐
3. Do you return medicines to their proper place as soon as you have used them?	☐	☐
4. Do you always check the label to be sure you're taking the medicine you intend to take?	☐	☐
5. Do you keep all medicines in their original containers?	☐	☐
6. Do you refuse to take medicine prescribed for someone else or to lend your prescription medicine to another person?	☐	☐
7. Do you learn all you can about the medicines you take—both prescription and nonprescription?	☐	☐
8. Do you carefully follow directions on the labels?	☐	☐
9. Do you throw out old medicines?	☐	☐
10. Are you careful about using alcohol when taking medicines that make you sleepy?	☐	☐

TEACHER NOTES for
Activity IV-I-F-2

In PART IV, exchange of PART II Survey, try to make sure that no student knows for sure the author of the "borrowed" survey.

TEACHER NOTES for
ACTIVITY IV-II-A-1thru4

A. The Case Studies may be read at home or at school in class.

B. Discuss advertisements. This part of the activity may be done a week or two before the activity or continue a week or two after A, C & D are finished; or it could even be a continuing, on-going assignment.

C. Discuss criteria bases for choosing after "A" has been completed.

D. Discuss questions, especially 5 & 6, after they have been completed. See if a representative of the local agency can visit the class or vice versa.

TEACHERS NOTES for
ACTIVITY IV-III-B

USRDA

This activity has a lot of arithmetic involved with it. A review of percentages is advisable, also metric measures and conversions to and from the English system.

I. Several labels may be copied or collected prior to this activity. Show students where to look for nutritional labeling on the can.

A - E. Go through an example with the students

F. Work through the example with students.

G - H. Go through an example with students.

II. Places have been provided in the chart for comparison of any nutrient. This chart can also be used to compare one fruit with another, a vegetable with a fruit, etc.

ACTIVITY V-I-A-1 thru 3

INTRODUCTION:

Diseases of the workplace are just beginning to become known to the public as other than problems for coal miners. While black lung disease (pneumoconiosis) has become fairly 'famous', asbestosiosis from asbestos, brown lung disease from cotton, and other health hazards are becoming more well known. What is becoming increasingly evident is that virtually every occupation has special risks and health hazards.

This activity explores risks and pollutants a worker is exposed to in the process of trying to earn a living.

Directions:

Use Work Can Be Dangerous to Your Health, Stellman and Daum, as a reference, especially "Health Hazards by Occupation", pp. 360-419.

Look at 6 pictures and describe the following for each picture:

1) Picture # _____, Picture description:

   a. General occupation:

   b. Occupational safety risks: (example: overcrowded office conditions or welding girders at a great height)

   c. Pollutants involved:

2) Picture # _____, Picture description:

   a. General occupation:

   b. Occupational safety risks:

   c. Pollutants involved:

(continued)

3) Picture # ______, Picture description:

a. General occupation:

b. Occupational safety risks:

c. Pollutants involved:

4) Picture # _____, Picture description:

a. General occupation:

b. Occupational safety risks:

c. Pollutants involved:

5) Picture # _____, Picture description:

a. General occupation:

b. Occupational safety risks:

c. Pollutants involved:

6) Picture # _____, Picture description:

a. General occupation:

b. Occupational safety risks:

c. Pollutants involved:

TEACHER NOTES for
ACTIVITY V-I-A-1 thru 3

1. Gather as many pictures of people working as possible, in three categories: (color pictures generate the most interest among students) *
   a. indoor - office, factory, construction

   b. transportation - subway, bus, taxi, railroad

   c. outdoors - street, construction

2. Briefly discuss the general health hazards in each of the categories.

3. Give 6 pictures to groups of no more than 4 students and have them fill out the required information.

4. Discuss, as a class, high risk and low-risk jobs, health hazards in various jobs, and in the 3 categories in particular.

* An alternative is to ask the students to bring in pictures of the workplace. Have them note which kinds of job are depicted the most often and then offer an explanation as to why this is true.

ACTIVITY V-II-A-1 &2

A-Introduction

Epidemiology is the study of disease distribution in populations and the factors which influence this distribution. An epidemiologist may collect data about a certain disease in a population to find out possible causes of that disease. The data collected by the epidemiologist may lead to a working hypothesis.

The data on which this activity is based is taken from The Journal of Occupational Medicine.

B-Background Information for this Study:

Lead can be ingested with food and/or water, or inhaled. In any of the three cases, lead finds its way to the bloodstream. It can then be stored in the tissues, eliminated and/or excreted.

Two common ways of finding out how much lead a human has been exposed to is to take blood and urine samples then test them for lead concentration.

Normal lead levels in humans:

blood level	0 - 60 ug/100ml.	(micrograms/100 milliliters)
urine level	0 - 80 ug/L.	(micrograms/liter)

Symptoms:

acute: paralysis, anemia, brain damage, respiratory failure.

chronic: buildup of system causing severe disorders of the blood, digestive system, liver, kidneys, central nervous system.
- shaking and reduced eye-hand coordination
- emotional effects such as hostility, depression, generalized unhappiness

intermediate: stomach trouble, insomnia, sometimes loss of teeth

C-Data

The following data, along with the above background information, will be used to make a graph and answer questions.

In an industrial plant, workers blood and urine levels were tested and found to be as follows:

Jobs in the plant	Job abbreviations
Lead-tin solder workers (solder is used to join metallic parts)	LT
Lead cutters	LC
Lead Burners	LB
Firing Range Sweepers	FR
Painted Steel Burners	PB
Solder Cream Workers	SC

(continued)

	Blood levels of lead (ug/100ml.)	Urine levels of lead (ug/L.)
1. LT	20	130
2. LC	94	---
3. LC	70	---
4. LC	64	---
5. LC	34	---
6. LC	47	---
7. LB	38	73
8. LB	48	68
9. LB	68	66
10. LB	45	82
11. LB	53	116
12. LB	50	72
13. LB	44	44
14. LB	32	70
15. LB	38	84
16. LB	46	106
17. LB	46	142
18. LB	34	96
19. LB	59	180
20. LB	40	123
21. LB	32	92
22. LB	41	128
23. LB	40	57
24. LB	39	84
25. LB	48	128
26. LB	51	80
27. LB	66	86
28. FR	98	334
29. PB	35	70
30. SC	48	65

D-Do graphs on graph paper.

E. Questions: To be done AFTER completing graphs.

1. Which of these workers do you believe have been exposed to lead vapors?

2. Which of these workers would you say were exposed to CHRONIC levels of lead?

3. What symptoms would you expect these workers (in #2) to have?

4. Which of these workers would you expect to have been exposed to TOXIC levels of lead?

(continued)

5. List the symptoms that you would expect these workers (in #4) to have.

6. Of the 6 jobs listed, in which job might exposure to lead be the highest?

7. According to Environmental Pollution, Andrews ed., the average North American has a blood level of 0.25 ppm. Can you relate this to the data? Explain.

8. Which additional data might you need to answer question #6 more accurately?

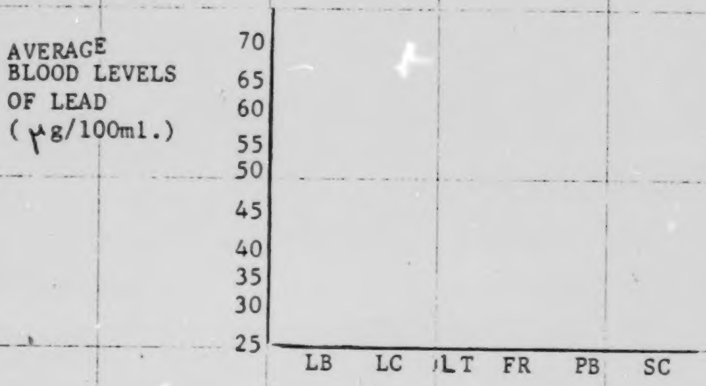
9. If a person had a change of personality, a poor appetite, was vomiting and had a 140 ug/liter level of lead in the urine, what might be the diagnosis of the illness?

10. Define: epidemiology:

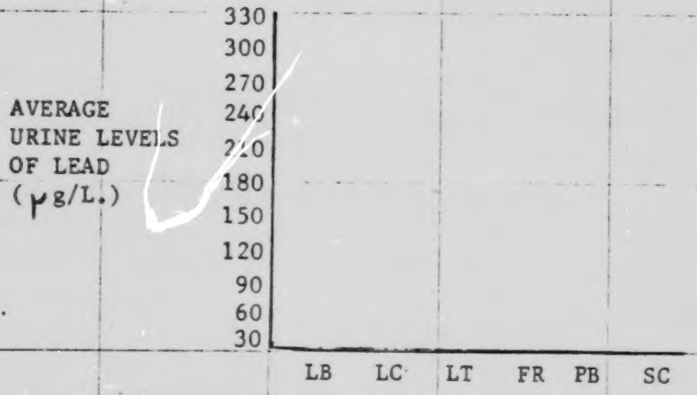
TEACHER NOTES for
ACTIVITY V-II-A-I & 2

For PART D.- The Graphs:

D. Graphs: Find the average lead blood levels for each occupation in the plant. Show the average lead levels for each occupation in the graph below by darkening the column for the appropriate job.



Find the average lead Urine levels for each occupation in the plant. Show the average lead levels for each occupation in the graph below by darkening the column for the appropriate job.



Asbestos

ACTIVITY V-II-B-1 & 2
Number 1

Introduction: Asbestos is a fibrous mineral used for heat-proofing and fireproofing. It has been used in everything from brake linings to acoustical tile to children's toys. Once in the lungs, it can cause asbestosis (development of lung scar tissue due to inhaling asbestos), mesothe-liomia (cancer of the membrane lining of the chest or abdomen) and other health problems. This activity deals with the history of asbestos in the workplace.

Directions: READ: Part I of Paul Brodeur's Expendable Americans and fill in the following Chronologies, based on your reading.

Part A. History of the Tyler Plant

PAGE	DATE	EVENT
6	1918	
6	1926	
11	1935-1936	
25	June 30, 1936	
7	1940	
7	November, 1954	
10	1962	
27	July, 1963	
18	December, 1966	
18	February 3, 1967	
18	March 7, 1967	
19	March 20, 1967	
19	March 27, 1968	
25	February 13, 1969	
27	May, 1969	
27	January, 1970	
3	February 3, 1972	
4	February 11, 1972	
4	April, 1972	

V - Diseases of the Workplace

ACTIVITY V-II-B-1 & 2
Number

PART B. History of Epidemiological Research and Findings by Dr. Irving Selikoff

PAGE	DATE	EVENT
7	1951	
8	1953	
8	1954	
8	1961	
9	Early, 1962	
12	Early, 1962	
14	June, 1963	
12	1963-1966	
15	October, 1964	
28	1968	
29	Spring, 1969	
28	January, 1970	
29	Autumn, 1970	

PART C. Essay

Originally, researchers believed that only asbestos workers who had been working in areas of high concentrations of asbestos for long periods of time (20 years) would develop asbestosis and other respiratory diseases. What did Dr. Selikoff's research show to contradict these beliefs?

PART D. Questions:

1. Describe the procedures involved in the closing down of the Pittsburgh Corning factory in Tyler, Texas.

2. How long did it take to totally dismantle the Pittsburgh Corning plant in Tyler, Texas?

(continued)

3. What were the reasons given for the closing of the Pittsburgh Corning factory:

   a. By the Tyler plant (by E. W. Holman):

   b. By the legislative department of Oil, Chemical and Atomic Workers International?

4. What problems did Dr. Selikoff encounter in trying to obtain the employment records of the workers from the Patterson factory?

5. What convinced Dr. Selikoff that there was a definite relationship between asbestos and cancer?

6. What was the safety standard for dust in asbestos factories in 1946? (the threshold limiting value)

7. Who made up the 1946 safety standard?

8. How was the 1946 safety standard established?

9. What error(s) was made in instituting (setting up) these standards in the Tyler plant?

10. What was the striking finding of Dr. Selikoff and Dr. Hammond which was later confirmed by Dr. Newhouse?

11. Why was Dr. Selikoff's and Dr. Hammond's report of 1963 so important to the epidemiological field?

(continued)

12. What prevented the possiblity of action to remedy any health hazard in Corning's asbestos plants after the Occupational Health people found serious health hazards in this plant (from 1963 to 1970)?

13. How big is a cubic centimeter?

14. How big is one micron in inches?

15. What are the three main pulmonary ailments that were found in the workers of the Tyler Plant?

16. Would the diseases experienced by the workers of the Tyler Plant be considered "acute" or "chronic" diseases?

17. How long does it take for these diseases to develop?

18. When was the Occupational Safety and Health Act established?

19. What is the purpose of OSHA?

20. Why was the National Institute for Occupational Safety and Health established?

21. When was it established?

22. What is the difference between NIOSH and OSHA?

23. What tests did the medical-epidemiological team conduct (under Dr. Cralley) on workers of asbestos-textile and friction materials plants?

24. IN YOUR OPINION - Why do you think that the medical-epidemiological team (in Question #23) conducted these particular tests?

25. What were the four causes of death which were found to be "extraorinarily high" among the workers of the Patterson plant?

Berylliosis

Introduction: A worker's disease may be caused by exposure to a pollutant in the workplace. Pollutants in the workplace often go unnoticed. Chronic absenteeism due to poor health of workers often alerts management to investigate the working environment. Such investigations may show that the worker's poor health results from some pollutant in the workplace. The following 3 Tables represent data an epidemiologist might collect to find this out. By gathering information about the workplace, the epidemiologist can examine what the possibilities are of the worker being exposed to a pollutant. There are various factors to look at when determining this relationship, including dose level and how long ago the worker was exposed to a pollutant. Finally, it may be possible to determine whether there is a cause-effect relationship between the response (symptoms) of a worker and a given dose of a pollutant.

Reference: Occupational Exposure to Beryllium, United States Department of Health, Education and Welfare, NIOSH.

PART A. Industrial Exposure - study TABLE I

1. What is the table reporting?

2. What does "DWA" stand for?

3. What is a survey?

4. How many years was the survey carried out?

   What were the survey years?

5. What was the range of the lowest exposure level surveyed?

6. How many workers were exposed to over 10 $\mu g/m^3$ in 1962?

7. What was the trend in number of employees from 1958-1962?

8. What was the trend in % exposure to the two higher levels of beryllium (over 5 and 10 $\mu g/m^3$)?

(continued)

9. What is the difference in the 4-year trend between those exposed to high levels and those exposed to low levels?

10. What was the year when there was a great change in the trend in % exposure greater than 5 $\mu g/m^3$?

    What do you think might have been responsible for this change?

PART B. Factors - study Table II

1. What is the title of the table?
2. What does "confirmed cases" mean?
3. What are the variables involved? (variable: a quantity capable of assuming any of a set of values.)
4. What are the constants, if any?
5. What do the dashes (----) mean in the table?
6. In how many cases did symptoms appear even when the worker no longer held the job in which there was exposure to beryllium?

PART C. Possible Correlation? - See Table III

1. What % more cases were from direct exposure than from non-occupational exposure?
2. What % more cases were from being in the same building as opposed to being in a different building?
3. Is there a direct correlation between exposure to beryllium and chronic and acute-chronic berylliosis based on this data? Explain.

(continued)

ACTIVITY V-II-B-1 & 2
Number 2

Essay: A person you know complains to you of inflammation of the mouth, gums, weakness, loss of appetite and weight and poor digestion. These symptoms could be the result of a specific disease. What questions would you ask to find out if this person might have a disease of the workplace (based on this activity)? (3-4 paragraphs)

TABLE I

REPRESENTATIVE WORKER DAILY WEIGHTED AVERAGE (DWA) EXPOSURES TO BERYLLIUM (Be) *

PLANT B

Survey Year	1957	1958	1960 Production	1960 Other	1961 Production	1961 Other	1962 Production	1962 Other
No. of Employees	200	116	155	58	77	77	37	44
Max. DWA μg/m^3	73	10	9.8	10.7	6.4	3.2	3.3	4.3
% Exposed 0-2.0 μg/m^3	4.0	82	25	62	93.5	62	24	43
% Exposed 2.1-5.0 μg/m^3	66.5	11	50	31	4.0	38	76	57
% Exposed 5.0 μg/m^3	15.0	7	25	0	2.5	0	--	--
% Exposed 10 μg/m^3	14.5	0	0	7	0	0	--	--
No. Exposed to Instantaneous Level 25 μg/m^3	14**	16**	90	4	2	6	0	5
No. Exposed to Instantaneous Level 100 μg/m^3	19**	0	2	0	0	0	6	0

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* Data supplied by U.S.A.E.C. Health and Safety Laboratory.

** In addition, these operators were also exposed to 29 μg/m^3 during 6 min. stay in the clothing change room.

TABLE II

CONFIRMED CASES OF CHRONIC BERYLLIUM DISEASE FROM THE BERYLLIUM CASE REGISTRY OF WORKERS EXPOSED SINCE 1949

Sex	Year of Birth	Source of Exposure	Duration of Exposure	Dates of Diagnosis	Proximity to Source	Delay between 1st Exposure & Symptoms	Environmental Levels (μg Da/m^3)
M	1919	Machining & Polishing-Fabrication work with Be-Cu	1 year	9/67	Handling or Breathing Zone	2 1/2 years	General Room Air 19.7 Polishing Operations 208.0, 346.0 Machining 0.08 to 1.6
M	1939	Machining--Be Alloys	2 1/2 months	1/69	Handling or Breathing Zone	10 years	---
F	1924	Ceramics -- Be in Porcelain	15 years	9/63	Handling or Breathing Zone	13 years	---
M	1932	Be Powder	5 years	5/69	Handling or Breathing Zone	Less than 5 years	---
M	1917	Ceramics	6 weeks	1965	Handling or Breathing Zone	---	---
M	1927	Foundry-Smelting Be	3 years	1969	Handling or Breathing Zone	3 years	---
M	1940	Grinding Shop - Be-Ni Alloy	9 1/2 years	1961	Handling or Breathing Zone	3 years	---
M	1940	Ceramic Macnine Shop--Technician & Maintenance	9 1/2 years	1971	Handling or Breathing Zone	8 1/2 years	Per Employer: daily weighted averages: Low 0.7, High 5.9, Avg. 2.0
-	1922	Smelting & Extraction	Greater than 2 years	1971	Handling or Breathing Zone	Less than 10 years	---

TABLE III

CHRONIC AND ACUTE-CHRONIC CASES BY PROXIMITY TO SOURCE

Mode of Exposure	Number	Percent
Non-occupational	6	1.8
Beryllium plant, different building*	15	4.5
Under same roof as source	44	13.2
Direct exposure	267	80.5

* Building other than one in which beryllium materials are processed.

TEACHER NOTES for
ACTIVITY V-II-B-1 & 2
Numbers 1 and 2

These two activities (Asbestos and Berylliosis) are 2 different ways of approaching the establishment of cause-effect relationships. Both activities take approximately 2 class periods plus work at home for most students.

Number 1: Asbestos:

> Reference material is Expendable Americans, by Paul Brodeur, Part I (72 pages). The story is not written in chronological order, so the student must fill in the chart provided out of the book's sequence.

Number 2: Berylliosis

> Reference material is 3 Tables attached to the activity. The student must interpret these tables and make their own analysis based on the data given.
>
> Therefore, review chart reading in general before students do the activity. In order to answer the essay, chronic symptoms may have to be reinforced or reviewed with students.

ACTIVITY V-I-C-1 thru 2

Introduction:

Beryllium is a light metal with many uses; especially important as a use in space-age technology. Besides being light, it is rigid, heat stable, and its oxide has a high heat conductivity which are properties that make it especially good for aircraft, missiles, and space ships. Beryllium, however, is a highly toxic metal which, if not properly handled and/or disposed of, may contaminate air, water, soil, or even a worker's household.

This activity deals with the development of the discovery of berylliosis as a neighborhood disease originating from the workplace.

Directions:

Read: "Beryllium and Berylliosis", by Jack Schubert, from Scientific American. Write a brief report using the following as an outline:

I. Background

  A. When was berylliosis first noticed and under what circumstances?

  B. What are the uses of beryllium and/or in what industries would one find beryllium in use?

II. Health Effects

  A. Chronic and accute effects

  B. Dose: amount, length of exposure

III. Non-occupational aspects

  A. "neighborhood" cases

  B. Air, water and soil occurences and standards

IV. Control

  A. Government regulations

  B. Personal hygiene

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BERYLLIUM AND BERYLLIOSIS

JACK SCHUBERT

August 1958

Extracted from beryl, a crystal which is almost identical with emerald, this light metal has found glamorous applications in modern technology. It is also capable of causing a serious disease

Injury and death to hundreds of American workers during the 1940s might have been averted if the prescient advice given a decade earlier by an Italian physician had been heeded. On the basis of animal experiments and known human cases, Stefano Fabroni gave the name berylliosis to an illness which followed soon after the inhalation of dust and fumes of irritating salts of the relatively obscure metal beryllium. He wrote: "In view of the important practical applications of beryllium in industry . . . which all indicate that the importance of this metal will continue to grow, we feel it is of interest now to call the attention of scientists to the picture of berylliosis . . . so that there will be the chance of timely development of measures to prevent this grave malady of the lungs from being added to the catalogue of industrial diseases."

The story of berylliosis is one of the most fascinating, contradictory, infuriating and controversial episodes in medical history. Some medical people argue even now that beryllium is incapable of causing disease. One writer in *The Lancet*, the esteemed British medical journal, invoked sheer sentimentality: "Beryllium seems to be the Admirable Crichton of metals. . . . To charge such an admirable metal with having poisonous properties is about as distasteful as accusing a trusted butler of stealing the family plate."

When one examines the clinical, biochemical and toxicological evidence, however, one cannot escape the fact that beryllium has caused at least 500 cases of poisoning in the U. S. alone during the past two decades. Particles of the metal or its compounds, wherever they are deposited, but especially in the lungs and skin, do extensive local damage to the tissues; reduction in respiratory capacity and general systemic debility have terminated in death in 10 to 30 per cent of all the cases.

Beryllium performs heroic functions in hundreds of everyday products even though its total annual production is measured in pounds. A little beryllium goes a long way, especially in the alloys which account for most of its consumption. It is a glamorous newcomer to metallurgy, one of a number of rare metals now brought into wide use by virtue of highly specific properties which technology has only recently learned to appreciate.

Beryllium has special glamour because it is the element that distinguishes the crystal structure of the precious emerald. The discovery of beryllium in 1798 stemmed from the observation by the French mineralogist René Just Hauy that the optical properties of the emerald were identical with those of the more common mineral beryl. He asked Louis Nicolas Vauquelin to make a chemical analysis. Vauquelin proved that both substances had the same composition and contained a new element. Since the salts of beryllium are sweet-tasting, the new element was first called glucinium. The name beryllium was given by Friedrich Wohler in Germany in 1828, when he succeeded in isolating the pure metal. With an atomic weight of nine, it is one of the lightest elements.

The emerald is a transparent, intensely green variety of beryl. The hexagonal crystals of beryl itself may be greenish, bluish or rosy, but in the field they tend to assume the color of the granitic rocks with which they are generally associated. Occasionally they attain gigantic size, up to two or three feet in diameter and several feet in length, weighing several tons. Some 60-ton crystals have been found.

Beryl is the single industrially significant beryllium-bearing mineral. The small size of the beryllium ion favored its diffusion as a minor constituent in numerous minerals, and discouraged the formation of high-concentration beryllium minerals. The world resources of beryl are estimated at four million tons, the principal deposits being in Brazil. Miners have to move, on the average, about 100 tons of rock in order to hand-pick half a ton of beryl crystals. A ton of beryl, which sells for $400 to $500, yields about 70 pounds of beryllium, worth about $1,200. (Emerald is worth some $25 billion per ton!) For better or worse, the production of beryllium will always be measured in pounds.

As a light element, beryllium should be a great deal more abundant on earth. It appears, however, that the beryllium nucleus is easily destroyed by collision with high-energy protons, as in the sun and other stars. In the cold reaches of

BERYL closely resembles emerald and aquamarine. The large crystal is beryl. At left in foreground is limestone containing emeralds. Second from left is an aquamarine. Third and fourth are emeralds. Specimens are in the American Museum of Natural History.

interstellar space, where such collisions are rare, beryllium occurs in much higher relative concentration. The scarcity of beryllium on earth, then, indicates that our planet passed through a stage of stellar temperature. Curiously the cosmic-ray bombardment of the earth's upper atmosphere results in the transformation of nitrogen and oxygen into beryllium 7 and beryllium 10, two radioactive isotopes of the element. The latter has a half-life of 2.5 million years; incorporated in snow and ocean sediments, it fills an important gap in geological age measurement.

The principal uses of beryllium stem from the discovery in the 1920s that the addition of only 2 per cent of beryllium to copper forms an alloy six times stronger than copper. Beryllium-copper alloys stand up at high temperatures, have great hardness, show resistance to corrosion, do not spark and are nonmagnetic. One finds them used in the critical moving-parts of aircraft engines and in the key components of precision instruments, mechanical computers, electrical relays, switches and camera shutters. Springs made of these alloys retain their springiness almost indefinitely. Beryllium-copper hammers, wrenches and other tools are employed in petroleum refineries and other plants where a spark from steel against steel might ignite an explosion or a conflagration.

The peculiar virtues of its alloys brought a sudden expansion of beryllium production during World War II. The needs of war machines were so specialized and urgent that it was easier to expand the supply of this rare element than to look for substitutes. Moreover, it happened that beryllium was destined for a special role in the development of the atomic weapons.

When beryllium atoms are bombarded with alpha particles (*e.g.*, from radium), their nuclei disintegrate and yield a profusion of neutrons. This reaction led James Chadwick to the discovery of the neutron itself in the early 1930s, and a radium-beryllium source provided the neutrons for the historic experiments of Enrico Fermi that led to the discovery of uranium fission. Beryllium is one of the most efficient materials for slowing down the speed of neutrons; it is also an excellent neutron reflector. The Manhattan Project overnight created a big new market for beryllium. Incidentally, one of the physicists working in the program is numbered among the first clearly diagnosed cases of berylliosis in the U. S.

Beryllium remains today an important material in nuclear technology. At least one U. S. atomic submarine went to sea powered by a beryllium-moderated reactor, and a reactor in the U.S.S.R. has a beryllium moderator and reflector. Last year the Atomic Energy Commission invited proposals for the supply of about 100,000 pounds of "reactor-grade" beryllium a year for five years. This amounts to roughly a 30-per-cent increase in production.

Presently the makers of advanced aircraft, missiles and of space ships to come are developing ambitious plans for beryllium. The metal has much higher rigidity and heat stability than the other light metals, qualities that commend it for use in airframes and rocket bodies. The oxide has a higher heat conductivity than any known ceramic and looks like a promising material for re-entry cones. Were it not for its toxicity and scarcity beryllium might make the ideal rocket fuel; it packs more energy per unit volume than any other element.

The general public first became acquainted with beryllium as an ingredient in the phosphors that give fluorescent lamp tubes their glow. Until 1949 nearly all fluorescent tubes were coated with beryllium phosphors. It was this use of beryllium that first exposed large numbers of industrial workers and the general public as well to the hazard of berylliosis. Most of the cases have been traced to exposure to the phosphor dust, either in the manufacturing process or in the disposition and incidental destruction of old fluorescent tubes. By 1949 the list of cases had grown to such alarming proportions that the major manufacturers of fluorescent tubes decided in consultation with officials of the U. S. Public Health Service to discontinue the use of beryllium phosphors.

The ill effects of beryllium compounds on workers who handled them were first observed in the U. S. in 1940 by Howard S. Van Ordstrand and his colleagues at the Cleveland Clinic. The workers were employed in processing beryllium ores; one of them died late in 1940. Not long afterward the first cases involving workers exposed to beryllium phosphors were recorded in Pennsylvania. Suspicion of beryllium was allayed at this early stage, however, by medical literature dealing with similar cases in Europe. Beginning in 1933 there had been reports from Germany, Italy and the U.S.S.R. of an occupational disease peculiar to beryllium workers. Because the victims were exposed to fluorine and other acid-forming compounds of the metal, and because the symptoms so closely resembled the effects of wartime poison gases in which fluorine was the active ingredient, the trouble was laid to the corrosive action of acids, not to beryllium. The clinical picture of the Ohio and Pennsylvania cases fitted precisely the symptoms described in the European literature: a first stage of chills, fever and profuse perspiration, then progressive involvement of the lungs, shortness of breath, a painful cough and an X-ray picture suggesting tuberculosis. Accordingly the U. S. physicians adopted the European diagnosis and exculpated beryllium, even though some of the victims, those working with beryllium phosphors, were exposed to beryllium oxide, which forms no acids.

By 1945 Van Ordstrand had reported on 170 cases of illness in beryllium workers. These patients exhibited damage to the skin as well as to the lungs. The findings were typical: 42 of the patients had severe skin ulcers with the most intense reaction occurring on the hands, arms, face and neck. When exposure to beryllium compounds was terminated, the dermatitis subsided and cleared up. Some ulcers persisted. In these cases a minute crystal of beryllium or a beryllium compound was invariably found entrapped within the skin; healing followed removal of the crystal.

In 1946 the hazard that threatened beryllium workers developed an alarming new aspect. Most of the cases reported up to that time had been acute attacks arising during exposure to beryllium compounds. Two physicians associated with the Massachusetts industrial hygiene office, Harriet L. Hardy and Irving R. Tabershaw, now reported on 17 cases of chronic illness arising long after exposure had ceased. All these patients had been engaged in the manufacture of fluorescent lamps in a plant in Massachusetts, and had worked an average of 17 months in the building where the phosphors were compounded. Their illness did not become noticeable until six months to three years after they had quit working in the building and had ceased to have contact with beryllium.

The beryllium compounds involved in these cases had no fluorine or other acid-forming element to divert concern away from beryllium itself. The recipe for phosphors called for pure beryllium oxide, mixed with silica and the oxides of other metals and fused in a furnace at temperatures in excess of 2,000 degrees Fahrenheit. After firing, the rock-like batch of phosphors had to be pulverized for coating the inside of the lamp tubes. The operation was at times a dusty one and exposed the skin and respiratory system of the workers to beryllium compounds in powdered form.

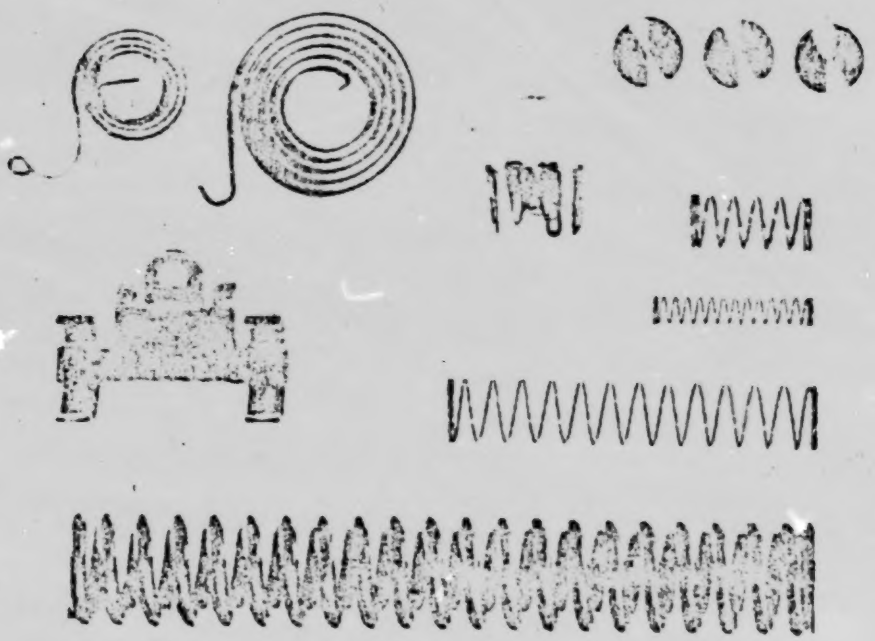
The cases of delayed or chronic illness clearly implicated beryllium itself as the poison. The principal distinction between the various beryllium compounds now appeared to be merely their relative solubility in the body fluids. The acid-forming compounds are the most soluble; in the Cleveland ore-processing plant they produced immediate illness. The lesions in the lungs and skin in these cases were only incidentally complicated by the action of acids. In its oxide, beryllium appears to be somewhat less soluble, and in its silicate phosphor-compounds even less so. These compounds produced the delayed illness among the fluorescent-lamp workers.

The chronic form of berylliosis is distinguished from the acute chiefly by the delay between the exposure to beryllium and the onset of symptoms. The case of the Manhattan Project physicist mentioned earlier typifies the course of the chronic disease. His exposure began in 1938 at Columbia University, where on several occasions he handled finely powdered pure beryllium metal in making up neutron sources. Later at Chicago, where he was engaged in assembling the world's first nuclear reactor, he handled beryllium-oxide bricks. The first sign of his illness was not detected until 1946, when a routine chest X-ray yielded the finding "the lung fields are diffusely granular in appearance and look subjectively like silicosis." At that time he felt in good health, and nothing was done about his condition. In the summer of 1948, however, he went to the hospital, suffering general debility and with his weight down 20 pounds.

There are 35 similar cases, in which symptoms were not noted until more than 10 years after exposure. Chronic berylliosis is difficult to diagnose. The symptoms of shortness of breath, lowered vitality, weight loss and reduction in respiratory capacity are typical of many debilitating illnesses. The chest X-ray, which is said at times to give the appearance of a sand- or snow-storm, may be mistaken for tuberculosis and other diseases. Unless the physician has special experience and instruction he may misdiagnose a case of chronic berylliosis such as still turns up occasionally among persons who were exposed a decade ago, before the disease and its cause were adequately recognized.

Just as in the delayed form of the lung disease, the skin lesions caused by the less-soluble beryllium compounds do not appear until several months after exposure. This was a hazard particularly for the unwary consumer when beryllium was used in fluorescent-lamp phosphors. A typical case was that of a 12-year-old boy who was admitted to a Boston hospital with small painless swellings around the angle of the jaw on the right side. His story was that three months previously he had been playing with some friends at a dump. One of the boys, deciding an old fluorescent lamp tube would make an excellent baseball bat, hit a bottle with it. The tube broke, and pieces of phosphor-coated glass hit the patient on the right side of the neck. About eight weeks later small lumps began to appear beneath the scars on his face and neck. Upon analysis the tissue was found to contain several micrograms of beryllium. With the complete removal of the beryllium from the tissue, the condition cleared up.

The epidemiology of berylliosis assumed a truly bizarre character in the discovery of the so-called "neighborhood" cases of the chronic disease in 1947 in a Midwestern city. Not one of these people had ever worked with beryllium or handled it in any form. All of them, however, had lived within three quarters of a mile of a plant which pro-

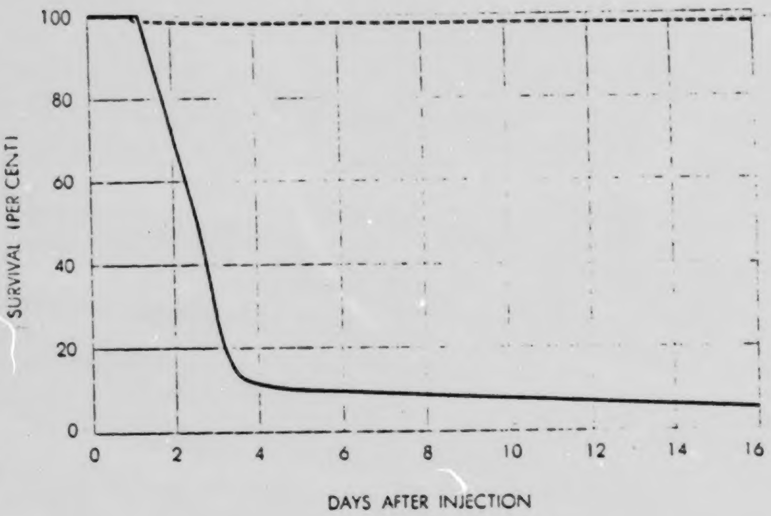


METAL PARTS are made of beryllium and its alloys. At upper right are three small disks of pure beryllium, used as windows for X-ray tubes. All the other metal parts shown here are made of beryllium-copper alloy, which is six times stronger than copper.

duced beryllium compounds from ore. When physicians in the community learned about these neighborhood cases, they soon discovered others in their records of undiagnosed lung disease. The apprehensive plant management instituted a chest X-ray survey; among 10,000 persons examined, two additional cases of berylliosis were discovered. It turned out that traces of beryllium were being emitted from the plant in the stack gases. Altogether more than 40 such neighborhood and nonoccupational cases of beryllium poisoning have been recorded. One woman lived nearly two miles from a beryllium plant; her husband worked in the plant, and she received her exposure from the dust she inhaled while washing his work clothes!

The registry of cases kept by Harriet Hardy at Massachusetts General Hospital in Boston shows that about 40 per cent have been of the chronic type, with a mortality rate of about 30 per cent. About 15 cases have involved individuals working in atomic-energy developments during the war years—an ironic fact in view of the extreme measures taken to protect workers from radioactive poisons. The Atomic Energy Commission has since led the way in the establishment of safe working conditions in the beryllium industry.

While beryllium alloys as commonly used appear safely nontoxic, one laboratory experience is instructive. During World War II a group of surgeons, testing various alloys for repair of massive bone damage, tried one alloy containing 1.6 per cent beryllium. They fixed plates of the alloy in dog skulls with screws made of the same alloy. After six months they were startled to find that the screws had loosened and that the screw holes and tissues in contact with the plate were lined with inflamed lesions.



MICE WERE INJECTED with a beryllium salt at Argonne National Laboratory. An hour later half of them were injected with aurintricarboxylic acid (ATA). Broken line shows survival of mice injected with ATA; solid line, survival of those not injected.

As yet the biochemistry of beryllium poisoning is little understood. The ion of the metal, dissociated from the oxide or salt in solution with the body fluids, appears to be the active principle. We know also that the chemical reaction of beryllium ions in the body invariably involves a hydroxide group (OH) attached to a benzene ring. Such phenolic hydroxide groupings, as they are called, are found in the amino acid tyrosine, which in turn undergoes metabolic transformation to such compounds as adrenalin which react with beryllium ions.

In the test tube beryllium inhibits the action of many enzymes. Injection of tiny amounts of its compounds in experimental animals causes massive damage to the cells of practically every organ with which the compounds come in contact. Similarly in human victims, upon autopsy, lesions are found scattered throughout the organs of the body as well as in the lungs. Beryllium poisoning is now accepted as a general disease, and it is recognized that the patient is sicker than the lung picture would suggest.

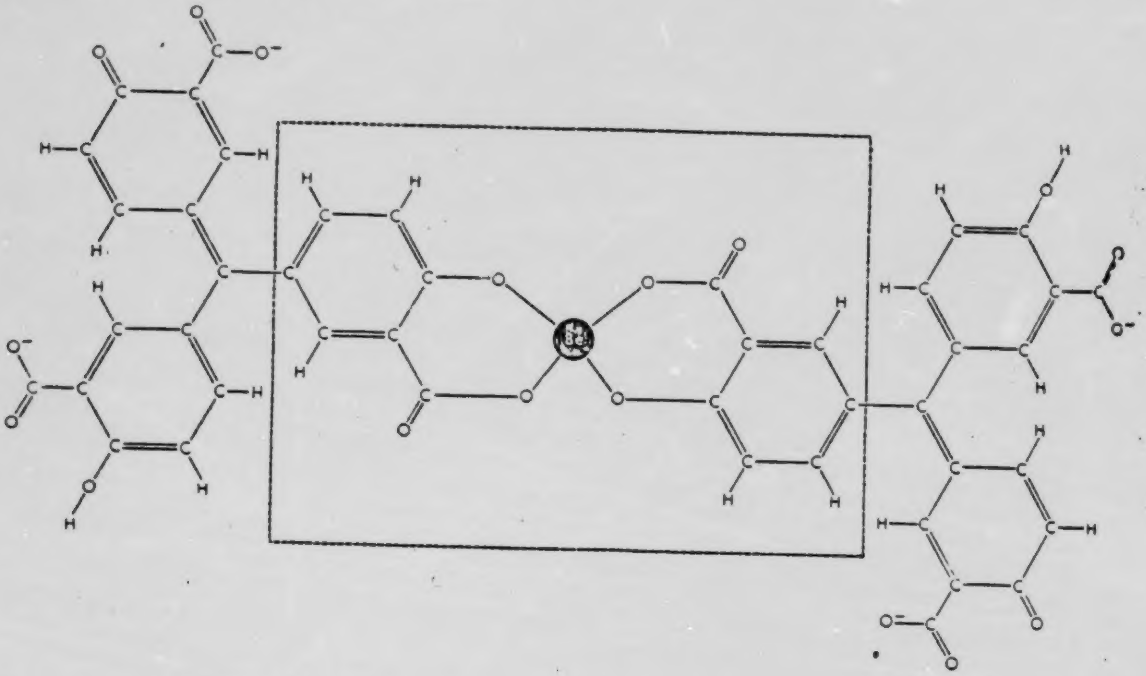
Examination of the lumps and nodules that form in the tissues suggests that beryllium possesses some power to cause the growth and proliferation of cells. This suspicion has been supported by the discovery that beryllium may induce cancer in experimental animals. The late Leroy Gardner of the Saranac Laboratory showed in 1946 that the intravenous injection of beryllium compounds in rabbits led to bone cancers. This finding has since been confirmed and extended to various animals, including guinea pigs and rats. Lung cancers also have been produced repeatedly with beryllium compounds. The investigators conclude: "These studies pose the grave question whether beryllium may not ultimately prove a factor in the genesis of certain cases of human lung cancer."

The question how beryllium acts on the tissue cells leads into the whole general problem of the role of trace metals in the processes of life. M. B. Hoagland at Harvard University has demonstrated that the growth-stimulating effect of beryllium is a general one, acting on algae and higher plants as well as on animal tissues. When he supplied a very small amount of beryllium salt to the nutrient of a tomato plant that had been stunted by depriving it of magnesium, the growth of the plant immediately showed a marked acceleration.

Ignorant as we are about the toxicity of beryllium, investigators have made one significant finding which already facilitates diagnosis and may lead to the discovery of an effective treatment. Patients invariably exhibit a kind of allergic response to beryllium compounds. It would seem, therefore, that beryllium must combine with protein in the body to form an antigen. The antigen stimulates the formation of beryllium-specific antibodies. As a result, in all cases of active berylliosis a small amount of any beryllium compound placed on the skin produces a local allergic reaction. This "patch test" is now a valuable aid in the diagnosis of beryllium poisoning. The finding that beryllium forms compounds with protein suggested in turn that the logical approach to treatment is to look for a way to tie up beryllium chemically so that it can no longer react with substances in the body.

With this in mind, our group at the Argonne National Laboratory began a search for a specific antidote to beryllium poisoning. At first we studied the possibility of injecting materials into experimental animals which would hasten the elimination of beryllium. However, we soon learned that it is nearly impossible to eliminate the poison once it has been deposited in the tissues.

We then determined to look for a drug



ACTION OF ATA is explained. The molecular structure of ATA is given in the diagram at left. ATA is a chelating agent, i.e., a substance which chelates or sequesters a metal ion within a larger structure of atoms. In this case the metal ion is beryllium (Be). The

which would seek out beryllium deposited in the body and form an insoluble compound, thus inactivating the metal. Such an agent, we thought, might be found among the chelates, an interesting class of dyestuffs which have the power to incorporate various metal ions selectively in their structures [see "Chelation," by Harold F. Walton, beginning on page 344].

We did not have to search long. There is a deep-red dye, well known to analytical chemists, which is used for the analysis of aluminum and to a lesser extent for beryllium and which, on paper, seemed to meet our requirements. This dye is known by the trade name "aluminon," and by the chemical name aurintricarboxylic acid, or simply ATA. In the first test of ATA we injected mice with enough beryllium salt to kill them within a few days. We then injected half the animals with a small dose of ATA and left the others untreated. The results were dramatic: virtually every animal treated with ATA survived and lived on normally, while all of the untreated animals died. We have repeated this experiment with hundreds of animals of different species, with the same high degree of protection.

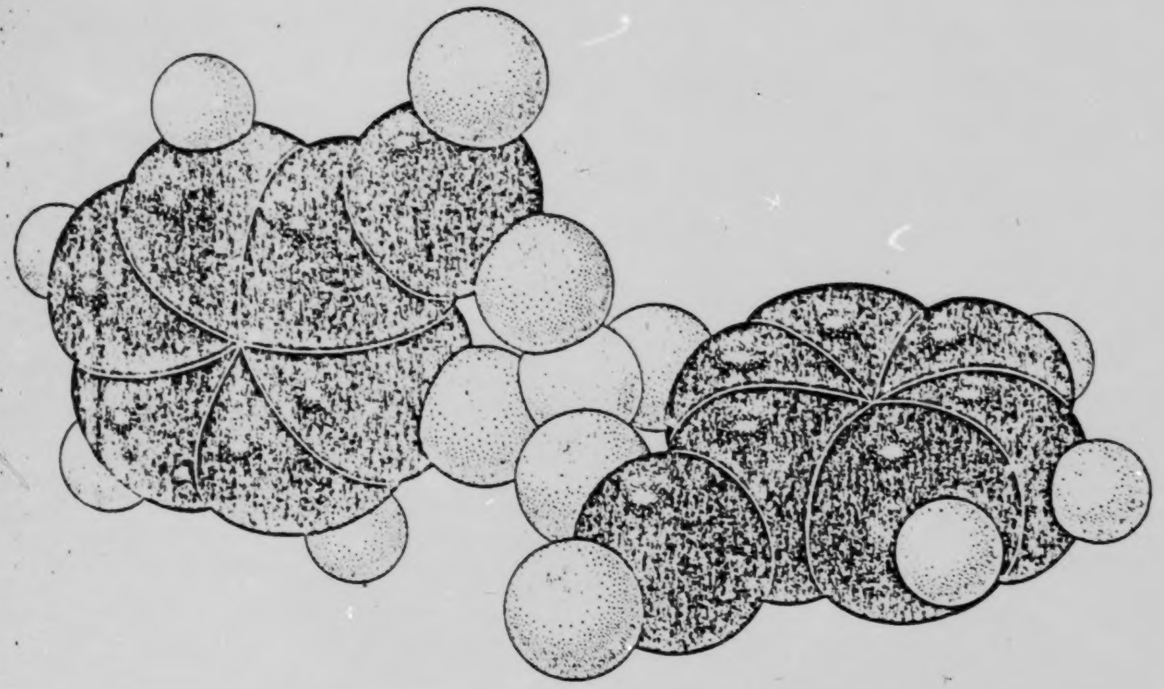
We checked the conclusions suggested by this experiment by injecting the animals with radioactive beryllium and with ATA tagged with tracer atoms. The picture that emerged was clear and unambiguous: ATA was found in practically every cell where beryllium was present. Previously damaged cells recovered, and within a few days could not be distinguished from the normal tissue. Nor could any abnormality be detected a year or more later, despite the fact that the beryllium-dye combination remained in the tissues.

We have tested many other compounds and found none as completely effective as ATA. Some of them have demonstrated a high affinity for beryllium in the test tube, yet have failed completely when injected in the experimental animal. Capacity to tie up beryllium does no good if the compound is unable to make contact with the beryllium in the tissues. All the compounds that failed have chemical groups which render them more water-soluble. As a result, they tend to remain in the water of the body and are rapidly excreted.

It is too early to say whether ATA will prove to be successful for the treatment of human beings. Clinical tests are being made. The main problem is to promote contact between ATA and beryllium. One approach involves the use of a special aerosol generator which breaks down the ATA into extremely small particles to insure that the material penetrates deep into the lung spaces. Intravenous injections will be tried along with the aerosol treatment. On the theory that ACTH and cortisone might render the lumps and nodules in the tissues surrounding the beryllium more permeable, these drugs may also be used in combination with ATA. As to the toxicity of ATA, physicians report they "are satisfied beyond any doubt that the ATA preparation is nontoxic, easy to administer and well tolerated by the patient."

Meanwhile, treatment of berylliosis patients with ACTH or cortisone has shown some success. Just why these drugs are helpful remains unknown. Certainly they have no effect on the beryllium itself. They do, however, provide many patients with some or with considerable relief. In the case of the Manhattan Project physicist described earlier, treatment with ACTH restored him to almost full activity.

Can the beryllium hazard be controlled? Is it possible to work with beryllium compounds in safety? The answer is a somewhat qualified "Yes." The problem reduces itself to one of good industrial housekeeping, which means keeping the levels of beryllium low. But how low is low? One important factor to be taken into account is that different forms of the same beryllium compound



three-dimensional structure of the atoms within the broken rectangle at left is shown in the illustration at right. When ATA is injected into body fluids containing beryllium, it sequesters the beryllium ions so that they cannot exert their poisonous effects.

may have radically different degrees of toxicity, depending upon particle size as well as solubility. On the basis of extensive tests the AEC early in 1950 concluded that all known cases of the acute disease could be attributed to air concentrations of soluble salts in excess of 100 micrograms per cubic meter, and that when the air level exceeded 1,000 micrograms of beryllium, nearly everyone developed acute beryllium poisoning. To minimize the risk of the chronic disease, on the other hand, the AEC found it necessary to recommend a limit of two micrograms per cubic meter. The strictness of this standard can be appreciated when it is realized that the corresponding limits for dusts of other metals such as lead, mercury, arsenic and cadmium range from 100 to 500 micrograms per cubic meter. As to the air in the neighborhood of a beryllium plant, the recommended limit is one hundredth of a microgram per cubic meter. To the best of our knowledge, no cases of beryllium poisoning have appeared in or around plants which have adopted these rigid standards.

These limits are, in fact, so low that they raise the general and sinister question whether the natural occurrence of beryllium in the environment might not at times be sufficient to induce beryllium lung disease in hypersensitive individuals. The tissues of most persons contain negligible amounts of beryllium, actually less than a microgram in the entire lungs, for example. Ordinary outdoor air contains about a thousandth of a microgram or less of beryllium per cubic meter. Beryllium, however, is concentrated by some plants, especially those growing in areas where the soils contain higher-than-average amounts of beryllium. The ashes of wheat straw are reported to contain as much as 2 per cent beryllium. Again, its concentration in certain coal ashes goes as high as 2 per cent. Another site of high concentration is forest litter. Examination of the lungs of coal miners has shown beryllium usually present in amounts far in excess of normal and in many instances greater than in known berylliosis cases. Yet the lungs of these miners had no lesions suggesting the disease. It must be emphasized that the severity of berylliosis does not necessarily reflect the amount of beryllium in the lungs. The total amount is not as important as the fractional amount present in an active form. It seems, therefore, we do not have to worry that we might fall victim to chronic beryllium poisoning merely from breathing outdoor air.

I say "seems" because physicians remain puzzled by some 1,800 cases of sarcoidosis, a lung malady, discovered among troops from the southeastern states during World War II. Their condition resembles berylliosis. The soil of their granitic native countryside has a higher than average beryllium content. Recently investigation has shown that the pollen dust of local evergreens carries lipid compounds similar to lipids found in tubercle bacilli. But the case is not yet closed.

More than 250 years ago Bernardino Ramazzini, the great student of industrial diseases, wrote that when physicians have a working man as a patient they should inquire into all the details of his occupation, because without this information a correct diagnosis cannot be made. The story of beryllium highlights the whole problem of occupational disease in the present era. Advances in technology now develop so rapidly that the rare material of yesterday becomes the widely used material of today. The beryllium mishaps teach the lesson that the harmlessness of a material cannot be taken for granted; a new material must be regarded as harmful until proved otherwise. Industrial medicine must provide safe working conditions before harm results; public health agencies must see that the public is not exposed to fumes from industrial processes until safe tolerances are known.

Sethtown

Introduction:

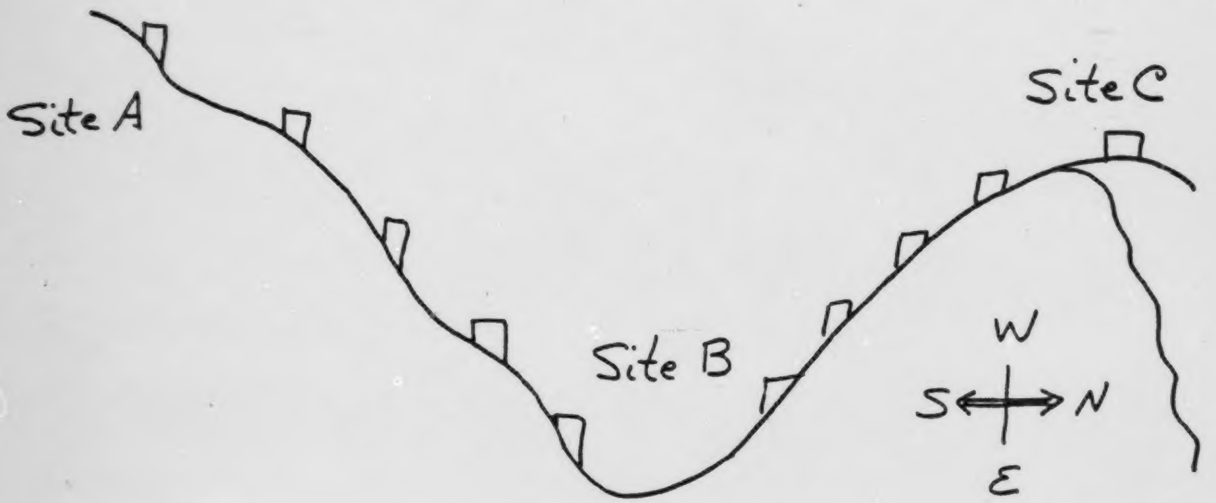
You live in Sethtown, a rural community located in the mountains and hills with a stream nearby. The town was formerly involved in strip mining (for coal). The coal mines are no longer providing enough coal to be profitable and so the mines are closing. You and your neighbors are threatened with unemployment and a mass exodus from Sethtown, unless employment from a new source can be provided.

A paper mill is interested in locating in Sethtown. You and your neighbors want the mill, but you don't want to suffer from pollution unnecessarily.

A study has been made of the impact of the proposed paper plant on the environment. It was found that the stream will not become polluted, but there will be a smokestack which will give off air pollution.

There are 3 possible locations for the plant. (See Figure 1) Site A is very hard to get to so an expensive road would have to be built to it; Site B is centrally located to all the townspeople; Site C is close to the source of water needed by the mill and is accessible to the townspeople.

FIGURE 1.



Sethtown, U.S.A.

(continued)

1. What are the arguments for and against the plant being located at each of the 3 Sites? (Refer to Table I to find any additional information that might influence a choice.)

Site A		Site B		Site C	
FACTORS FOR	FACTORS AGAINST	FACTORS FOR	FACTORS AGAINST	FACTORS FOR	FACTORS AGAINST

2. Where would you locate the plant? Why?

(continued)

3. How could you design the paper mill so that the smoke that it emits is dispersed as much as possible? (Refer to Table 1.)

TABLE 1.

Factors affecting distribution of pollutants

INCREASE IN	POLLUTION LESS (−) MORE (+)	TYPICAL EFFECT
Precipitation	−	Cleanses the air
Humidity	+	Dissolves many pollutants; renders pollution more visible
Fog	+	Remains the same
Sunshine	+	Initiates oxidation
Wind velocity	±	Less pollution near the source but faster and wider distribution
Wind direction from contaminating source	+	Greater contumination
Increasing temperature with increasing height	+	Less dispersion
Barometric pressure	+	Lighter wind; less dispersion
Height of emitting source	−	Enhances dispersion and dilution of contaminant
Mountains, hills	+	Break force of winds; but promote light winds
Valleys	+	Trap pollutants
Plains	−	Greater dispersion
Distance from contaminating source	−	Remains the same

TEACHER NOTES for
Activity V-I-C-1 & 2

There are several non-occupational cases included in the article. If lack of time is a factor, the article could be read at home and a report done on the three specific "neighborhood" cases. The rest could be discusses in class.

Follow up with a report on PCB's (New York Times Magazine Section, October 24, 1976.) This article describes how PCB's in industrial effluents reach humans through the food chain.

ACTIVITY V-III-A,B,C,D
Number 1

Control in reduction of health risk

Introduction:

You are a student; you may also have a part-time job. Either as a student and/or in a working situation, you are exposed to health hazards from various pollutants with which you come into contact (including transportation to and from school/work). This activity explores the various ways you and other workers can protect your health.

Part A-1 **Personal Health Record**

Date of Birth ____________ Present Age ________ Male ____ Female ____

(You need not include anything of a "too personal" nature. The idea of the record is for you to understand possible environmental health problems.)

a. Current medical history and complaints: Check whatever applies to you this week.

1) sore throat ( )
2) wheezing ( )
3) coughing ( )
4) shortness of breath ( )
5) temperature rise (short-lived) ( )
6) burning and/or pain in throat ( )
7) burning and/or pain in chest ( )
8) drowsiness ( )
9) blurred vision ( )
10) nasal irritation ( )
11) eye irritation/burning ( )
12) nasal congestion ( )
13) itching ( )
14) skin eruptions ( )
15) difficulty swallowing ( )
16) difficulty sleeping ( )
17) numbness ( )
18) headaches ( )
19) nervous irritability ( )
20) muscle stiffness and/or weakness ( )
21) backache ( )
22) nausea ( )
23) fatigued ( )
24) vomiting ( )
25) swelling ( )
26) diarrhea ( )
27) constipation ( )
28) metallic taste in mouth ( )
29) poor appetite ( )

b. Possible exposure to: 1) pollutant involved, 2) how log exposed, 3) how often exposed:

noise:

particulate matter (dust):

heavy metals:

radiation:

exhaust fans:

toxic chemicals:

ingested pollutants:

other:

(continued)

Part A-II

Review of Systems

General health description by system:

General: appetite, sleep, fatigue, weakness

Skin: rashes, hives, eczema

Head: headaches, dizziness, fainting

Ear, nose, and throat (ENT): hearing, sinusitis, epitaxis (Nosebleed), URI (upper respiratory infection)

Cardio-pulmonary: cough, sputum, chest pain, hemoptysis (expectoration of blood), dyspnea (difficulty breathing)

Gastro-intestinal: pain in relation to food, nausea, anorexia, constipation, diarrhea, hemorrhoids

Nutritional: special diets, typical day's diet, recent weight change, food intolerance, appetite

Urinary: dysuria (painful urination), discharge, backache

Vascular: Hypertension, variscosties (varicose veins e.g.)

Hemetological: bleeding, anemia

Neuro-muscular:

Skeletal:

(continued)

Part A-III

Respiratory Function Questionnaire

Height ____________________ Age __________________

Smoking History

Do you smoke? If YES:
- a. do you inhale?
- b. how many cigarettes a day?
  with filters
  without filters
- c. ounces of tobacco a week
- d. how old were you when you started smoking regularly?

If NO:
- a. if not smoking now, have you ever smoked?
- b. have you ever smoked as much as one cigarette a day for as long as a year?
- c. how old were you when you started smoking regularly?
- d. how old were you when you gave up smoking?
- e. how much were you smoking at the time you stopped?
- f. why did you give up smoking?
  doctor___, unwell ___, finance___, other____

Cough

a. do you cough when you get up or first thing in the morning?

b. do you cough like this on most days for as much as 3 months during the year?

c. do you cough during the rest of the day?

d. do you cough like this on most days for as much as 3 months during the year?

Phlegm

a. do you bring up phlegm when you get up or first thing in the morning?

b. do you bring up phlegm like this on most days for as much as 3 months during the year?

c. do you bring up phlegm during the rest of the day?

d. do you bring up phlegm like this on most days for at least 3 months during the year?

(continued)

Part A-III continued

Breathlessness

Do you have to walk slower than other people on level ground?

Wheezing

Do you have wheezing or whistle in your chest when you don't have a cold?

Weather

Does the weather affect your chest?

Medical History

In the last 3 years, have you had a chest illness that kept you off your job (or out of school) for at least one week?

What was it diagnosed as?

Have you ever had a heart attack? When?

Working conditions

a. do you work in a dusty area?

b. how much time do you spend in this dusty area?

c. do you work with any materials that irritate your nose, lungs or chest?

d. how long do you work with these materials?

e. how long have you worked on this job?

f. have you worked on any other jobs with the above conditions?

g. how long?

Any relevant comments on your working conditions? ____________________

____

____

This form was adapted from Work is Dangerous to Your Health, Stellman and Daum.

(continued)

Questions: Answer fully on another sheet of paper.

1. Do you believe any of your health problems had to do with pollution on the job? Transportation to or from the job? Explain.

2. What criteria did you use to pick the "hazardous substance" you made the inventory on?

3. How does keeping a personal health record help protect your health from chronic health hazards?

4. What was your opinion about smoking before you filled in the respiratory function questionnaire? What was it after you filled in the questionnaire?

Safety and Health Standards

Introduction

In 1970, the U.S. Congress passed the Occupational Safety Health Act which established a national policy of health and safety for workers in the U.S. The need for controlling workplace safety and health had been determined by the rising number of injuries, morbidity (illness) and mortality (death) rates due to occupationally related causes.

Standards for control of these pollutants are based on threshold limiting values (TLV). TLV's are the legal limits of pollutants allowed in the workplace. The levels are established by a government organization called the American Conference of Government Industrial Hygienists (ACGIH). Two other governmental institutions, NIOSH and OSHA, also play a part in setting government standards. Management in the workplace has the responsibility to comply with these standards.

This exercise shows how TLV's are established to set standards (I) and what industrial management does to comply with these standards (II).

I. TLV (Threshold Limiting Values)

A. Examine Figure I on Page 3 and answer the following questions:

1. What does the "bell-shaped" curve represent?

2. What part of the "bell-curve" shows the greatest number of people's threshold response (sensitive, average, resilient)?

3. What does "toxic effect" mean? Give an example.

4. How might a "sensitive" person respond to toxic effects compared to an "average" person?

5. What are some factors that could determine how "resiliant" a person is?

(continued)

B. This exercise is on NOISE. (Similar regulations exist for chemical and other physical factors.) Read Page 3 of this activity and do the following:

1. On the sheet provided, construct a graph of the information in Table I (Threshold Limit Values).

   a. label vertical axis (y axis)

   b. label horizontal axis (x axis)

   c. plot each point

   d. connect points

2. How many minutes may one be exposed to 110dBA according to ACGIH standards?

3. Is the relationship between "duration per day hours" and "sound level" (dBA) directly or inversely related?

4. For every 5 dBA, what is the corresponding decrease in exposure time permissible?

5. What is the "average hearing threshold level"?

6. How much louder is 100 dBA than 90 dBA? (Remember: decibels are a logarithmic measure, which means that while 10 decibels is 10 times greater than 1 decibel, 20 decibels are 100 times greater than 1 decibel, etc.)

(continued)

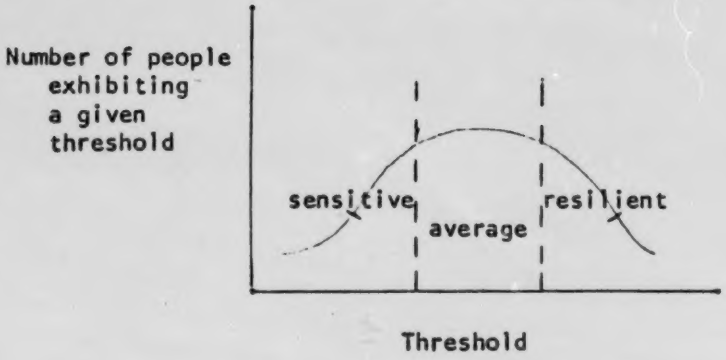


Figure I. Normal "bell-shaped" distribution of thresholds for toxic effects

(From Nicholas A. Ashford, Crisis in the Workplace, pg 117)

* * * * * * * * * * * *

The following information is from Journal of Occupational Medicine Vol. 16, pp. 57 and 58.

NOISE

These threshold limit values refer to sound pressure levels and durations of exposure that represent conditions which it is believed that nearly all workers may be repeatedly exposed without adverse effects on their ability to hear and understand normal speech. The medical profession has defined hearing impairment as an average hearing threshold level in excess of 25 decibels (ANSI-S3.6-1969) at 500, 1000, and 2000 Hz, and the limits which are given have been established to prevent a hearing loss in excess of this level. The volues should be used as guides in the control of noise exposure, and, due to individual susceptibility, should not be regarded as fine lines between safe and dangerous levels.

Continuous or Intermittent

The sound level shall be determined by a sound level meter, conforming as a minimum to the requirements of the American National Standard Specification for Sound Level Meters, S1.4 (1971) Type S2A, and set to use the A-weighted network with slow meter response. Duration of exposure shall not exceed that shown in Table I.

These values apply to total duration of exposure per working day regardless of whether it is one continuous exposure or a number of short-term exposures, but does not apply to impact or impulsive type of noise.

(continued on Page 3-A)

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:

$$\frac{C_1}{T_1} + \frac{C_2}{T_2} + \ldots \frac{C_n}{T_n}$$

exceeds unity, then, the mixed exposure should be considered to exceed the threshold limit value, C_1 indicates the total duration of exposure at a specific noise level and T_1 indicates the total duration of exposure permitted at that level. All on the job noise exposure of 80 dBA or greater shall be used in the above calculations.

Impulsive or Impact Noise

It is recommended that the exposure to implusive or impact noise should not exceed 140 decibels peak sound pressure level. Impulsive or impact noise is considered to be those variations in noise levels that involve maxima at intervals of greater than one per second. Where the intervals are less than one second, it should be considered continuous.

TABLE I

Threshold Limit Values

Duration per day hours	Sound level dBA a)
16	80
8	85
4	90
2	95
1	100
1/2	105
1/4	110
1/8	115*

* No exposure to continuous or intermittent in excess of 115dBA.

a) Sound level in decibels as measured on a sound level meter, conforming as a minimum to the requirements of the American National Standard Specification for sound level meters.

(ACTIVITY continued on Page 4)

C. READ the 7 OSHA b-oklets and fill out the following chart on 6 chemicals and 1 physical factor that poses a potential health hazard to a worker.

"Hot Environments"
"Toluene"
"Carbon Monoxide"
"Mercury"
"Lead"
"Vinyl Chloride"
"Beryllium"

D. Questions:

1. a. What is NIOSH?

   b. What does NIOSH do?

2. a. What is OSHA?

   b. What does OSHA do?

3. What are the different ways of eliminating pollutants from work environments?

4. In general, what is involved in good personal hygiene for workers?

5. Why is good personal hygiene so important to workers and their families (as it relates to environmental occupational hazards)?

6. Why is it so difficult to diagnose occupational diseases?

(continued)

CHART for PART C

Occupational Health Hazards

HAZARDS	WHAT IT CAN DO TO YOU	PREVENTION	PERSONAL HYGIENE	FEDERAL STANDARDS
BERYLLIUM				
CARBON MONOXIDE				
HOT ENVIRONMENTS				
LEAD				
MERCURY				
TOLUENE DIISOCYANATE (TDI)				
VINYL CHLORIDE				

II. Implemention - Industrial Management

READ Ch. 9 "Controlling Pollution in the Workplace", in Stallman and Daum, Work is Dangerous to Your Health. Also use the 7 OSHA booklets. Do the following exercises:

A. Name several (at least 5) devices that are used to control gases or fumes in the workplace. Explain the function of each.

B. Name several (at least 5) devices that are used to control particulate matter in the workplace. Explain the function of each.

C. Name several things (at least 3) that an individual worker can do to protect his or her health on the job.

TEACHER NOTES for
Activity V-III-A,B,C,D

Control in reduction of health risks

Background :

The following activities include questionaires, charts, inventories to fill out and questions to answer about control in reduction of health risk. The activities orient to four areas of control: self; small groups including unions and management; large government groups including ACGIH (American Conference of Governmental Industrial Hygienists), NIOSH (National Institute of Occupational Safety and Health of the Dept. of H E W), OSHA (Occupational Safety and Health Administration of the Dept. of Labor), and protective engineering.

Suggestions for implementation:

1. Discuss control in general
2. Assign the health questionnaires to be done at home. Make sure the students understand that "Personal Health Record" is for their own information. The "Personal Health Record" may be filled out more than once.
3. A "Hazardous Substance Inventory" might be done in class as an example before students try one on their own.
4. As an introduction to TLV's and the concept of "resilient" and "sensitive", have all the student's hearing tested, graph the results. The results should be close to bell-shaped in distribution.

TEACHER NOTES for
Activity V-IV-A-1

I. Review Workman's Compensation for your state with the students

II. The article should be discussed point by point in class as follows:

  A. Function of OSHA

  B. Lack of proof the CME, BCME occupationally caused

  C. Labeling of "suspect" chemicals

  D. Decontaminative of exhaust fumes - relate to "neighborhood" cases

  E. Record-keeping violations - relate to #1 in this activity

  F. Compensation cases

    1. private negotiations

    2. giving up the right to sue

    3. insurance covering worker claims

    4. waiver of statute of limitations

    5. Occupational Disease Act

    6. Provisions included in Workman's Compensation Act

    7. What the state provides

III. The student will have had to complete the other activities in this Mini-Course in order to uderstand the terminology of this part of the activity.

Follow-up: Invite a union officer to discuss worker's benefits.

ACTIVITY V-IV-A-1

Economic Issues in Workplace Health Hazards

Introduction:

There are 3 ways workers and their families are damaged by worker illness or injury: the injury or disease is painful and/or emotionally upsetting, the worker's family is faced with payments to medical aid rehabilitation services, the family's income is drastically reduced by the worker's inability to work or acceptance of a lower paying job. Workmen's Compensation functions to provide some kind of security to alleviate the worker's burden by providing medical care, protection against interruption of income, plus other benefits in some states. But, not all workers are covered and not all occupational diseases are recognized as being diseases of the workplace. In Work is Dangerous to Your Health, Drs. Stellman and Daum say, "The chronic lung disease that can arise from chlorine exposure (as one example of a chemical used in various industries) is the same disease that can result from long-term exposure to things like nitrogen dioxide, cigarette smoke, or cotton dust. It all looks the same to the doctor, no matter what the cause." Also, "State laws today almost always accept acute reactions and injuries, rather than chronic disease, as grounds for compensation."

I. Read "Agency Lists But Does Not Notify Workers Exposed to Carcinogens" from the New York Times 4/27/77.

A. What are 4 elements in the control program?

B. How would the program be especially helpful to poor people?

C. What provision would there be for chronic illnesses?

(continued)

D. What kinds of oscupationally-related health hazards are now not provided for by Workmen's Compensation? (Based on this article, other readings, class discussions.)

II. Case Study - BCME

A. Read the attached reprint from "54 Who Died" from The Philadelphia Inquirer, Oct. 26, 1975, with your teacher.

Due to a chemical BCME (bio-chloro-methyl-ether) 54 men and women employees of the Rohm and Haas plant, in the Bridesburg section of Philadelphia, died of respiratory cancer according to the authors of this article.

B. Write an essay discussing the advantages and disadvantages of making a Workmen's Compensation claim rather than a private settlement (especially with regard to exposure to chemicals of questionable occupational relationship.)

(continued)

III. Suggest which of the following are occupationally related or not related. Put an asterisk (*) by those items that you believe can be proven to be occupationally related. Explain your answers in one (or more) sentences.

A. cancer:

B. pneumoconiosis: (black lung disease)

C. emphysema:

D. asbestosis:

E. loss of hearing:

F. berylliosis:

G. leukemia:

H. depression:

I. dermatitis:

J. birth defects in offspring:

K. arteriosclerosis:

L. loss of a limb:

(continued)

M. anemia:

N. bronchitis:

O. pulmonary edema:

Agency Lists but Does Not Notify Workers Exposed to Carcinogens

By DAVID BURNHAM

Special to The New York Times

WASHINGTON, April 24—A Federal health agency has not informed tens of thousands of American workers whose names it has collected that they have been exposed to substances known to cause cancer, even though early warnings can result in cures or prolonged life.

The names and addresses of the 74,000 workers, who stand a far greater chance of developing cancer than the general public, have been gathered in scores of statistical research projects undertaken by the National Institute for Occupational Safety and Health over the last five years.

The head of the institute, Dr. John F. Finklea, said the workers had not been informed of the risks they face partly because his agency lacked the necessary funds and authority and partly because of his belief that notification without an effective follow-up system "might do more harm than good."

123,000 More May Face Risk

Dr. Finklea, a physician, said that further institute studies would probably identify 123,000 more workers who were at risk, and that the question of what the Government should do to help them was one of the major pending national health issues.

"Of course I am concerned," he said. "But the problem far exceeds my personal or even NIOSH's ability to do much about it. Given the present circumstances, you try to do the best you can and hope that others will do the same."

The institute's responsibility in gathering data on those exposed to dangerous substances was discussed in a memorandum April 8 by Dr. Kenneth Bridbord, head of the agency's Office of Extramural Coordination and Special Projects.

Dr. Bridbord said that if a government agency, corporation or union possessed the names of workers "whom they knew were at risk of cancer, and if they did not notify the workers of this risk, then all parties could conceivably be liable, should any of these workers subsequently develop cancer."

Dr. Finklea, asked in an interview whether the institute's inaction was in conflict with his professional responsibilities as a physician, replied, "That question is being tested in the courts."

The Department of Health, Education and Welfare, the institute's parent agency, is being sued by 400 asbestos workers on the ground that they have contracted asbestosis because the Government failed to give them timely warning about this frequently fatal lung disease.

In another court action involving a physician who was allegedly aware of an industrial pollution hazard, eight California workers have sued a former company doctor, alleging that the company had knowingly exposed the workers to excessive concentrations of a substance known to cause cancer and that the doctor had not informed them of the danger. This suit could be significant because there are at least 2,000 company physicians around the country who are responsible for the occupatonal health of fellow employees.

One of the dozens of research projects in which workers and former workers who faced special risks were identified involved two substances that have for more than 20 years been known to cause bladder cancer.

Recent experience has shown that, if detected in its early stages, bladder cancer frequently can be cured.

In 1972 and 1973, Dr. William M. Johnson, a physician then working at the institute, collected the personnel records of 2,500 workers who had been exposed to the two substances while working at dye plants in Connecticut, Georgia, Maryland, Michigan and South Carolina.

Last summer, Dr. Johnson, who is now doing graduate studies at the University of Arizona, wrote Dr. Finklea asking why the United States, unlike England and Italy, had not developed a system for the early detection and treatment of cancer in these workers.

In his reply, Dr. Finklea said that the personnel records of the 2,500 exposed men "could be made available to an appropriate agency, within the constraints of the Privacy Act of 1974, that may want to provide the type of assistance you mentioned: notfication, counseling, medical attention, etc."

Dr. Finklea added that this kind of program had been recommended at a 1973 Cancer Control Planning Conference and that the National Cancer Institute recently had been asked to provide the required funds.

"To date, we have not reached agreement with the N.C.I. on funding an occupational bladder cancer control project such as they have done with the asbestos workers in Tyler, Texas, and vinyl chloride workers in Louisville, Kentucky," the official told Dr. Johnson.

Dr. Finklea said that because many of the workers who were regularly exposed to hazardous substances were poor and highly mobile, simply notifying them of the increased likelihood of cancer was not of much value.

Elements in Control Program

An effective program to control cancer, he said, would require at least three other elements. These were as follows:

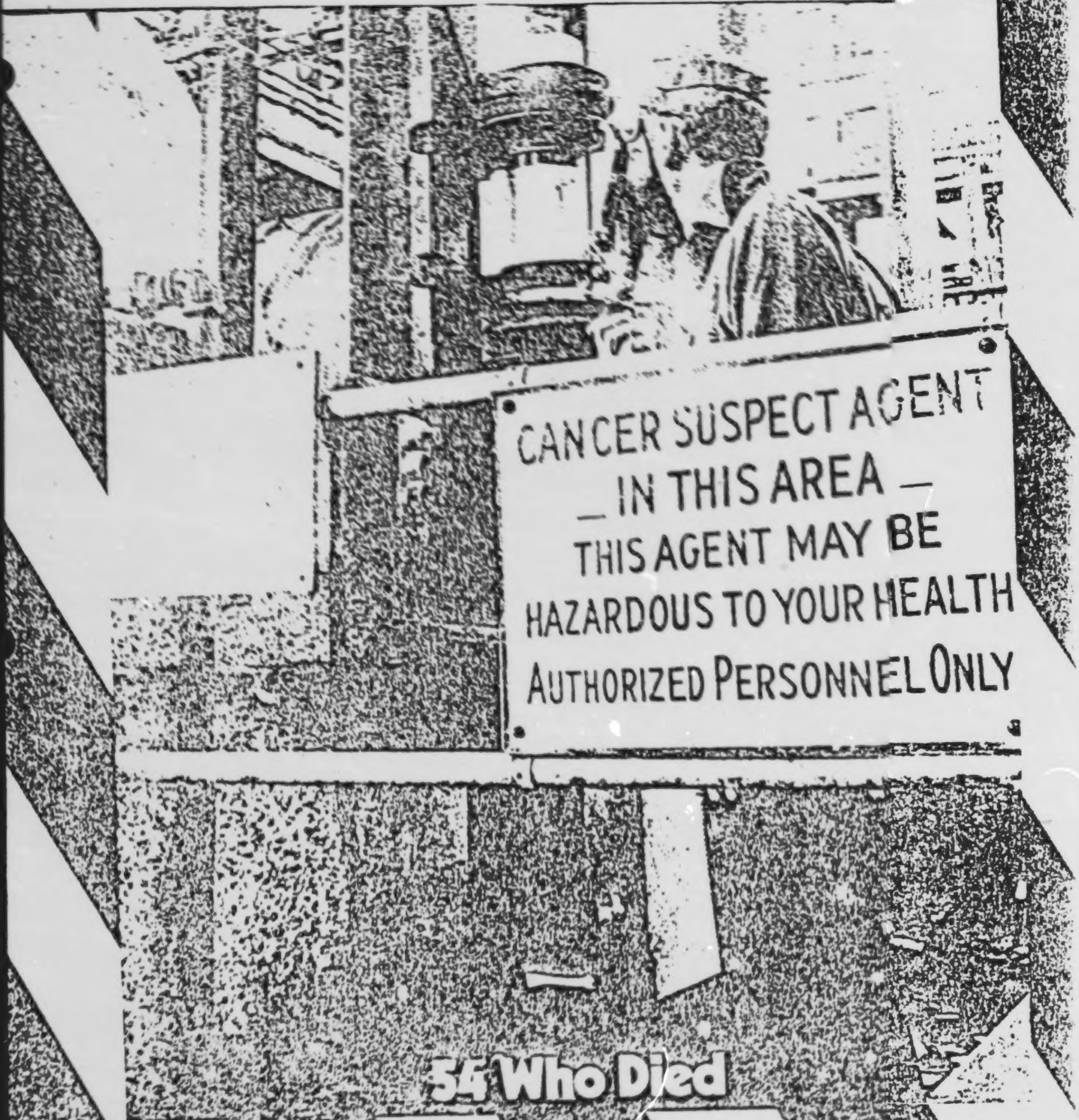
¶A national health care system that could provide low-income workers with medical treatment by doctors who were skilled and knowledgeable in dealing with occupational diseases.

¶A workmen's compensation system that would provide adequate payments for workers who have developed chronic diseases such as cancer because of conditions in their work places.

¶A national job security program that would require companies to find jobs in less hazardous areas—without a loss of pay—for workers whose health has been damaged while working with substances such as lead, coal tar pitch or benzine.

Congress has provided funding for one specific disease—the black lung that frequently strikes miners—that could serve as a model for the program outlined by Dr. Finklea.

Under the black-lung program, 160,000 miners were X-rayed and given notices of their condition. Clinics were established to assist those who were ill, though only temporary' relief is possible with black lung disease, a NIOSH spokesman said.



Reprinted with permission of Today Magazine, The Philadelphia Inquirer, Oct. 26, 1975.

54 WHO DIED

The OSHA annual inspection at Bridesburg took place from October 31 to November 5, 1974.

By this time, 52 workers had died of respiratory cancer after being exposed to BCME, ten since regulations under the Occupational Safety and Health Act went into effect.

Under Chapter VI of his own Compliance Operations Manual, OSHA Area Director Sachkar, now aware of the cancer hazard, had the clear responsibility to conduct an exhaustive investigation, or, under Chapter V, to assign a team of experts to conduct a general inspection.

Instead, he delegated the responsibility for the inspection to Mrs. Eileen Crenshaw, 28, a chemist with little knowledge of industrial practices and evidently unfamiliar with Chapter V of her Compliance Operations Manual, which stipulated that she must prepare thoroughly for an inspection.

Rohm and Haas, however, *had* prepared.

"The opening conference lasted all day," Crenshaw recalls

"Mr Longenberger summarized the company's experience with carcinogens to date," she reported to Sachkar. Basing her report on this summary, she wrote:

". . . in 1968 Hazleton Labs in Falls Church, Va., did three year-long animal studies of the 14 chemicals which included CME containing one percent BCME. All were non-suspect except CME, which was borderline."

In fact, the Hazleton studies showed BCME definitely carcinogenic in mice and CME borderline.

The next day, Ellington Beavers, the man who served on the Standards Advisory Committee setting the rules for handling BCME and CME, met with inspector Crenshaw.

By this time, the company had already conceded before the Pennsylvania Workmen's Compensation Bureau hearing the claims of some widows of BCME workers that lung cancer was an occupational disease caused by working with the chemical.

Yet the Crenshaw report said: "Dr. Beavers says he has seen no illness at plant except dermatitis which can be truly related to occupational exposure."

Crenshaw inspected OSHA Reporting Forms 102 for 1971 to 1973, Form 100 for 1974 and Form 101 for selected cases involving illnesses. The only recorded occupational illnesses were skin diseases and disorders. She asked why lung cancer deaths had not been recorded.

"Decision is based," she wrote, "on medical opinion that it cannot be proven whether the deaths were caused by CME and BCME or smoking, heredity, air pollution or other causes."

Crenshaw found two CME storage tanks which had improper signs—no warning words "Cancer-Suspect Agent" displayed immediately under or adjacent to their contents.

She found that current inventories of amounts of carcinogens on hand, including BCME, CME and vinyl chloride, were not being kept in the three lab areas.

Reporting the company's failure to decontaminate exhaust air before discharging it from laboratories, she nevertheless decided that no citation should be issued.

"I.H. (Industrial Hygienist—Crenshaw) feels it would be out of the mandate of OSHA to cite an employer for discharging exhaust air before decontaminating it, as this is not in the realm of employe health," she wrote.

Yet decontamination is required under OSHA regulations.

The escape of fumes over the plant, Frankford Arsenal and throughout Bridesburg had already caused area residents to lodge 57 smoke and odor complaints within six years with the city. Workers at the neighboring Frankford Arsenal had complained of noxious fumes, only to be assured by Dr. Robert Lang, the Rohm and Haas corporate safety director, that BCME dissipates immediately and is rendered harmless in the open air.

Despite Crenshaw's repeated notations that Rohm and Haas had not reported the lung cancer deaths as fatalities, and despite her statement that an attempt would be made to determine if the failure to report was a violation of law, Sachkar failed to send a team of medical experts to check the statements of Beavers and Ackerman.

Sachkar, Crenshaw and other OSHA officials were interviewed at their offices in the Gateway Building last May and were asked why OSHA had neither followed up the reports of worker deaths nor cited the company for the fines provided in the Occupational Safety and Health Act, which they administer.

David Rhone, the regional OSHA administrator, pounded his fist and shouted: "That kind of talk doesn't help us at all!"

After he cooled down, he explained at length that OSHA lacks the resources to monitor the 300,000 places of business in Pennsylvania, and that the agency has to rely on the "good faith of the companies."

Crenshaw, asked why the company was not cited for failing to file the reports of worker deaths and why the records of the dead men had not been requested by OSHA, replied:

"Beavers said they had no way of knowing they had any fatalities that were occupationally caused."

Crenshaw said she had not attempted, in the seven months which had elapsed since her inspection, to determine if there were any record-keeping violations, despite her responsibility to do so under chapter V of the Manual.

continued

Courtesy Rohm and Haas

Dr. F. Otto Haas, vice chairman of the board, was president of Rohm and Haas from 1960 to 1970 and later chairman of the board. One of the two sons of the company's founder, he is now the honorary German consul-general for Philadelphia.

Gordon West, administrative assistant to Vincent Gregory, was asked for copies of the OSHA Reporting Forms required by law to be kept by the company. On Forms 102, the annual summaries for the years 1971 to 1974, typewritten "O's" had been entered under the columns for "Fatalities."

But these had been crossed out, and the number of deaths for each year were handwritten in the margin with the date "11-7-74" and the initials "RSA," the same as Bridesburg plant safety director R. Stuart Ackerman. Seven deaths—five fewer than the authors of this article found—had been entered on summaries for 1971 to 1974.

In a letter dated June 27, 1975, West stated that "occupational illness fatalities were entered on Nov. 7, 1974, following the determination that they were occupationally related and after discussion of the proper procedure with OSHA."

It was on November 7, 1974, however, that OSHA inspector Crenshaw submitted her inspection report to Sachkar, who also signed it on that date.

Crenshaw had reported that, as of November 7, the company had not only failed to enter the fatalities on the proper forms, but had argued that the fatalities were not occupationally-related.

OSHA officials also contradicted West's assertion that the entries had been made on November 7, 1974.

When asked at the end of May 1975 whether the reports of occupational fatalities had been entered on the required forms, Regional Director Rhone, Area Director Sachkar, and inspector Crenshaw said that there had been no entries up to the end of May.

> *"Unfortunately, you put the widow at a real disadvantage when you ask her to remain single to collect $106 a week . . ."*
>
> **—Richard Ferroni, attorney, at hearings of the Workmen's Compensation Bureau**

In order to give the company an opportunity to explain fully its side of the BCME story, a series of meeting was held over a five-day period during which all levels of Rohm and Haas management discussed different aspects of the controversy.

One of the first questions dealt with compensation of the widows for the loss of their husbands. According to Vincent Gregory, this had been resolved many months before at Rohm and Haas headquarters after five of the widows had filed for workmen's compensation benefits.

"From 1971 onward, from the Nelson tests," Gregory said in an interview after lunch in the executive dining room, "there was a very, very strong possibility that BCME was the causative agent but there was no legal proof for the state and our insurance company so we could pay compensation.

"As soon as the Nelson information came in, we knew we had to have an epidemiological study to show the state that what Nelson found with rats would apply to humans.

"By May 1974, when I got advance word of the results of our own study, only two or three widows had filed and we advised the others to file."

By July 1975, only 14 months later, the company reported that it had settled compensation claims on 27 of the 29 BCME deaths it acknowledged. Five cases had gone through the Pennsylvania Workmen's Compensation Bureau in Philadelphia; the rest, the company said, had been settled through private negotiation.

The widows were entitled to $39 to $60 per week, according to their number of children, under the Occupational Disease Act, which governed their cases.

But Rohm and Haas had offered each of them $106 per week until remarriage or death, the amount payable in 1974 under a companion law, the Workmen's Compensation Act.

continued

To get the $106 per week, a widow and her children had to sign a statement which released the company, and its officers and directors, from any other legal claims, such as negligence and wrongful death, that might have been pursued in court.

Gregory was asked if the company had offered higher payment as an inducement for the widows to settle their cases and thereby release Rohm and Haas and its officers and executives from any legal claims.

"The best legal advice I have is that we could offer strictly what the workmen's compensation requires and we could have won every case in court (if the widow decided to sue instead)," Gregory said.

"My response was that while this is a legal settlement, it's not a moral or ethical settlement. Any lawyer who told you that Rohm and Haas settled for releases is so full of shit that his eyeballs are yellow."

The inspector noted that the only illnesses the company reported were skin disorders.

Employees covered by the Workmen's Compensation or Occupational Disease Acts, such as the BCME victims at Bridesburg, give up the right to sue in favor of automatic compensation payments that are set by law.

So the widows of the dead BCME workers could sue neither the company nor, after F. Otto Haas' amendment to the law in 1963, any of the company's officers and executives.

Clearly, however, the company had been worried. There was some question whether an increasingly liberal State Supreme Court would continue to recognize either the company's or the executives' immunity in cases where willfull conduct or gross negligence was shown.

The company knew that several of the widows' attorneys were considering a suit charging the company and its executives with gross negligence, and the attorneys had even gone so far as to call on a recognized workmen's compensation expert for advice.

The expert, who asked not to be identified, said employers often assigned workers to dangerous but money-making projects with the knowledge that they were free from suit and that their profits would absorb the premiums for insurance to cover the workers' claims.

"The workmen's compensation act was a tremendous social reform in the latter part of the industrial revolution," he said. "We said, 'Let's be humane. If a worker is killed or injured, he must be paid medical and funeral expenses plus compensation, regardless of fault.' The question was whether the injury was while at work.

"But what if the employer is not only negligent, but grossly negligent? Now employers use it as a cost-benefit analysis. Employers now take the risk because they can't be sued. But the act wasn't intended to protect the employer.

"I and other lawyers have tried to change the law. We wanted to argue to the Pennsylvania Supreme Court the basic proposition: Are we going to blindly follow the law and support a corporate business decision to expose workers to a hazard?"

But none of the lawyers have argued that proposition to the courts; the steps Rohm and Haas took after May 1974 were to get the widows of BCME workers to sign releases that would dispose of the nagging question of lawsuits once and for all.

The company made offers that the widows felt they couldn't refuse. The offer, Gregory said, was $106 per week from the very beginning.

"The decision to pay $106 was announced after the Nader HRG news conference (in October, 1974)," he said. "But the decision was made six months before. We had decided on a higher payment than under workmen's compensation. But the $106 wasn't decided until October."

Actually, the $106 was decided in October, but not until the company made an initial offer of $60 per week and was turned down by the widows.

The offer was made during a meeting in the Rohm and Haas board room on Monday morning, October 14, 1974. According to a sign-in sheet for the meeting, ten lawyers representing widows and seven lawyers representing the company and its insurance carrier, the Pennsylvania Manufacturers Association Insurance Company, attended.

Joseph H. Foster, of the Philadelphia firm of White and Williams, did most of the talking for the company, according to several of the widows' attorneys.

"He made an offer of $60 a week," recalls Richard Elliot, lawyer for Mrs. Leonard Bean. "I said that I regarded the offer as totally inadequate."

Unable to settle for $60 a week, Rohm and Haas came back a few days later.

"Joe Foster called me at home in the evening and, with great drama, told me that Rohm and Haas had come up with this great deal, that the company was going to be extremely generous and pay $106 a week," Elliot told us.

"I talked it over with my client. In terms of gross payout, if she attained a normal life expectancy and didn't remarry, a condition of the offer, she would get $162,000. Weighing that certainty against the uncertainty of a third party action (suit against officers and executives), I said the $106 offer should be given serious consideration."

Maxwell Gorson, lawyer for Mrs. Emmett Whalen, confirmed the October 14 meeting and the fact that "Foster did most of the talking. He made it clear that the money was for an agreement to give up the third party claim."

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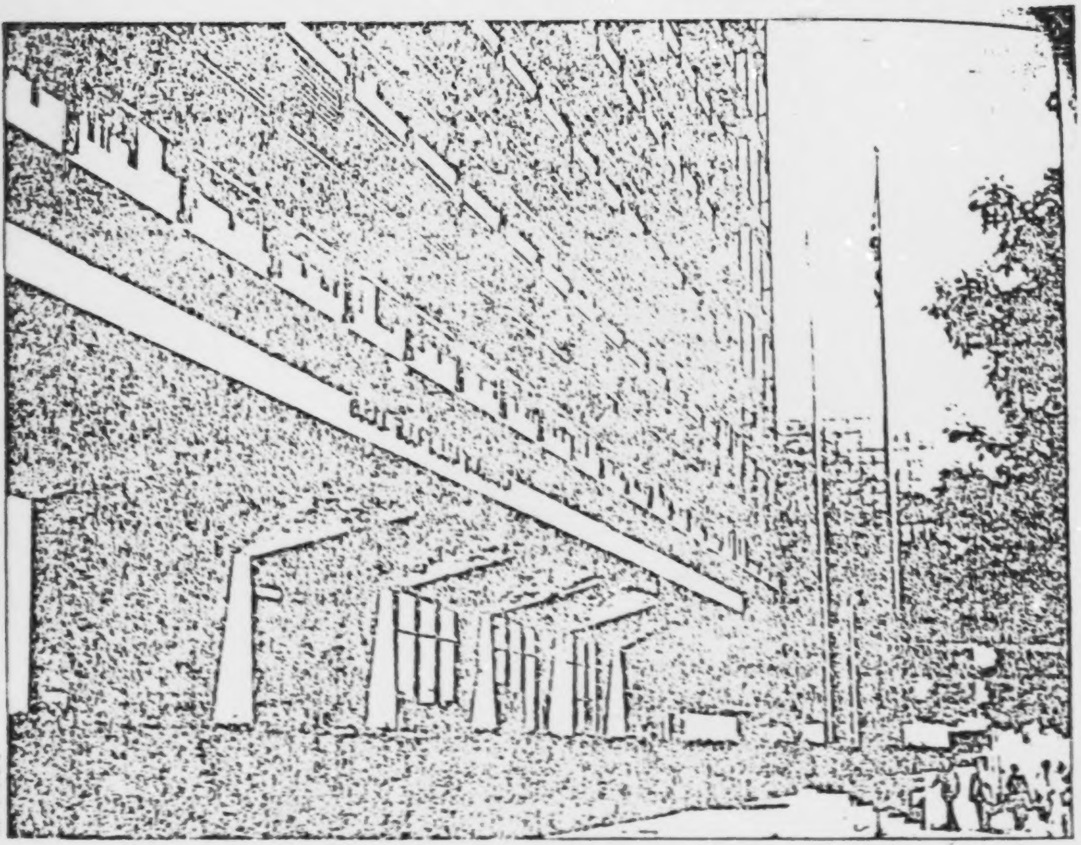

Earl E. Dove

The Rohm and Haas headquarters building at Sixth and Market Streets is a salute to Rohm and Haas inventiveness. The windows, murals, chandeliers, sculpture, lighting fixtures, telephones and doorknobs are of Rohm and Haas Plexiglas. The carpeting, insulation, wall coverings and ceiling tiles are of Rohm and Haas synthetics. The building also houses bomb shelters and the underground Colonnade Cafeteria.

Meanwhile, Rohm and Haas was telling the widows, their attorneys and the press that it was voluntarily waiving the 16-month statute of limitations as evidence of its good faith; otherwise, the company said, only the few widows who had filed compensation claims within 16 months of their husbands' deaths were legally entitled to compensation payments.

On October 9, Peter E. Perry, the regional manager of the Workmen's Compensation Bureau, issued a statement which invited all widows to file claims. The bureau, he said, would regard the statute of limitations as beginning to run on October 2, 1974, when the widows received notice that their husbands had died of an occupational disease, rather than at the time they actually died.

"Provisions of the compensation law and court decisions excuse such late filing where the workers or their dependents did not have knowledge that their disability or death was directly caused by exposure to a chemical," Perry said.

Nevertheless, during an interview in July 1975, Vincent Gregory maintained that only the company's voluntary waiver of the statute of limitations permitted the widows to file compensation claims.

"The statute of limitations would cut off all but six or seven cases," Gregory said. "The overwhelming number of cases would be cut off."

In fact, the Pennsylvania Supreme Court had ruled in a disability case as early as 1956 that the 16 months begin to run not from the time of death, but the time of first knowledge that the death was related to the occupation.

On Monday, November 25, exactly six weeks after the meeting in the Rohm and Haas boardroom, Referee Jerold Klevit held a hearing for the five widows who had filed petitions with the Workmen's Compensation Bureau: Bean, Karcher, Whalen, Nixon and Pontious.

John McElvenny, a lawyer with PMA Insurance Co., opened the session by saying Rohm and Haas would make compensation payments "in any case where the work experience records show that the deceased employes of Rohm and Haas had possible exposure to inhalation of the BCME and where the death occurred from cancer of the respiratory tract."

He had chosen his words carefully; his intention was to close off the possibility of a lawsuit and keep the claims within the workmen's compensation process.

continued

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McElvenny had followed the language of two Pennsylvania Supreme Court cases—one of which he had argued—which stated that the workmen's compensation process was the sole remedy for a disease peculiar to an occupation by its cause and manifestation.

Conceding that cancer was peculiar to the Bridesburg workers by its cause, BCME, and its manifestation, respiratory cancer, McElvenny was bringing the five cases within the exclusive provisions of the Act, thereby cutting off the possibility of a suit.

Referee Klevit was interviewed last June in the Bureau's offices in the state office building at Broad and Spring Garden Streets.

"PMA was very smart in this case," he said. "It said if the claimants in fact came in contact with the chemical and got lung cancer, it was an occupational disease. In other words, if the facts are proven, they are liable.

"When the agreements were signed, Rohm and Haas got two releases, one on workmen's compensation and one on common law actions. The second is the valuable one because it's a release from all liability from what happened there."

In addition to getting the releases from liability, which cut off any possibility of suits being filed against the company or its executives, Klevit said the $106 offer also purchased favorable publicity.

"Here you have a large employer with adverse publicity. To counter it, they pay over and above what is required. The public says, well, they're not such creeps as we think they are."

Another workmen's compensation referee, Irwin Stander, was asked about the $106 offer. He said:

"Well, what do you think? The lawyers (for the widows) were saying negligence to the point of recklessness. So it looks like they (Rohm and Haas) rushed like hell to settle as many of these cases as they could."

On Thursday, December 5, 1974, Gloria Bean, whose husband, Leonard, had died at age 53 on March 26, 1973, signed the papers that entitled her to $106 a week during widowhood and released the company and its executives from any further liability.

A week later, on December 12, as the company continued to settle other cases privately, Anna Whalen became the second of Referee Klevit's cases to settle.

Referee Klevit held another hearing on May 8, 1975, and the company submitted five agreements for approval. Within the last 48 hours, the widows of Samuel Nixon, Joseph Karcher and Robert Pontious had signed the papers settling their workmen's compensation claims.

The releases signed by the widows and children released Rohm and Haas, its successors, assigns, directors, officers, agents and employes from all claims arising out of the deaths.

They ended with the apocalyptic phrase, "from the beginning of the world to the date of these presents."

Marie Pontious, whose husband, Bob, after working his last few months helping Dr. William Figueroa, had become the hero of Building Six, said that even her children had to sign the release statement.

"Why did the children have to sign?" she asked. "That frightens me. The whole thing frightens me. But what was I supposed to do? I had to take the money, and it was blood money.

"But I have a child only 13, and I'm too old to learn a job even if I could get one. I had to sign, but I'll tell you this, I've never felt right about it. I still feel Rohm and Haas is getting away with murder."

Marie Pontious accepted the $106 per week, more than she would have received under the Occupational Disease Act, which governed her case.

But close study of the Act shows that the payment was not as generous as the company claimed.

Included in the $106 were the accrued interest and the $750 each for medical and funeral expenses that the Occupational Disease Act requires be paid above the weekly compensation rate.

And although the company was paying under the 1974 rates of the Workmen's Compensation Act because, as Gregory said, it was "moral" and "ethical" to do so, the company refused to give the widows any of the other modern benefits available under that law.

In 1974, the Workmen's Compensation Act paid, above the $106 weekly rate, an additional $750 in funeral expenses, full reimbursement for medical expenses, legal fees and ten percent interest.

In 1975, funeral expenses were raised to $1500 and compensation payable to a child, previously cut off at 18, was extended to age 23 if the child was enrolled as a full-time student in any accredited educational institution.

In addition, the Act no longer cut off compensation to a widow upon remarriage; in 1975, the Act provided a two-year lump sum payment to any widow who remarried.

Rohm and Haas gave the widows none of these additional benefits.

The company's refusal to make a lump sum payment on remarriage caused some bitter exchanges during the November 25, 1974, hearing.

Richard Ferroni, who represented Marie Pontious, asked John McElvenny of PMA Insurance Co. if Rohm and Haas would make a lump sum payment if Mrs. Pontious remarried.

McElvenny replied it would not.

Agitated, Ferroni replied: "Unfortunately, you put the widow at a real disadvantage when you ask her to remain single to collect $106 a week . . . She doesn't want to be relegated to the life of widowhood because she has to wait for $106 a week."

continued

Vincent Gregory was asked why the company insisted on ending the payment when a widow remarried. "Once you start breaking a rule, you break it right down the line," he replied. He laughed, adding: "I'd advise living in sin."

As it turns out, Section 307 of the Act terminates compensation benefits to any widow "living with a man . . . in meretricious relationship and not married."

In its rush to sign up the widows, the company caused a major legal problem.

In three of the five cases before Referee Klevit, the company had asked the state to contribute, as provided by law, 40 percent of the compensation rate payable under the Occupational Disease Act.

The state refused to pay, saying that the company's quick admission on November 25 was not good enough; evidence that the lung cancers were related to BCME was needed.

McElvenny answered the state with a brief which contained these documents submitted for the record:

. . . An article from the medical literature, cited as the first proof that BCME had caused the Bridesburg deaths. Ironically, it was the Figueroa article, constantly maligned by Rohm and Haas until the company needed it to help collect money from the state.

. . . Five medical certificates, one for each of the cases before Klevit, stating the cause of death as lung cancer caused by BCME. Again ironically, the statements were prepared by Dr. William Weiss, co-author of the Figueroa article and the former assistant to Dr. Sturgis on the Philadelphia Pulmonary Neoplasm Research Project. Weiss said Rohm and Haas had hired him to prepare the statements at $50 per hour and that he had received $475.

. . . Work histories of the dead workers, showing that they had been exposed to BCME. It turned out that these work histories, not available in 1968 to Dr. William Weiss or in 1972 when Dr. Figueroa requested them for his landmark study, were nothing more than the workcards routinely kept by the company.

On June 25, 1975, having accepted the company's offer, Mickey Olcese and her daughter, JoAnn, went to the office of their lawyer, Avram Adler, to sign papers releasing Rohm and Haas and its executives from liability in the death of Larry Olcese.

Oddly, Joann became the first of the children not required to sign off.

Evidently, Joe Foster, an attorney retained by Rohm and Haas, considered her an important enough adversary last March 1st to be concerned about her testifying before Senator Tunney's subcommittee.

"Two days before we were to go to Washington," Joann said, "my lawyer, Mr. Adler, called me and said Joe Foster called and I asked what did he say?

"'He just wanted me to ask you not to go down to Washington,' he told me. 'I said I couldn't say that because I know my client, she'll say, "Why, because you're being bought off, too."'"

For years, John D'Alessandro tried to avoid working in Building Six, but was finally "bumped" there in 1971 after a number of workers left the plant. After a year and a half of work, D'Alessandro retired with a disability payment of less than $100 a week. Doctors say he will never work again due to damaged muscles around his heart. Now 49, he spends much of his time watching television. He is able to bowl, but only with a lightweight ladies' ball.

Adler, asked if this was true, replied, "She only knows what I told her."

Foster was then asked if he'd made the telephone call to Adler, prevailing on him to ask his client, Joann Olcese, not to testify.

"Oh, for Christ's sake," he said, "how can you expect me to answer that?" He would neither confirm nor deny making the call.

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ACTIVITY V-IV-B

Introduction:

This activity is concerned with risks involved in working on a certain job, how the employee may be compensated for that risk, and how many safety hazards in the workplace can be eliminated.

The hospital is a workplace for people with a wide range of work skills. It is also an area of widely varied hazards, not only in the areas of constant exposure to patients with potentially infectious diseases, but also with chemicals, and as you will see in the reading for this activity, accidents.

1. READ "The Hospital: Hazardous Haven", originally printed in Job Safety and Health Magazine.
2. Make a list of hospital employees, include job titles and duties.
3. Make a list of safety hazards in the hospital and, where provided, include how to eliminate the hazards.

(continued)

4. List high risk jobs in the hospital. Which are financially or otherwise compensated for? Which are not?

The Hospital: Hazardous Haven

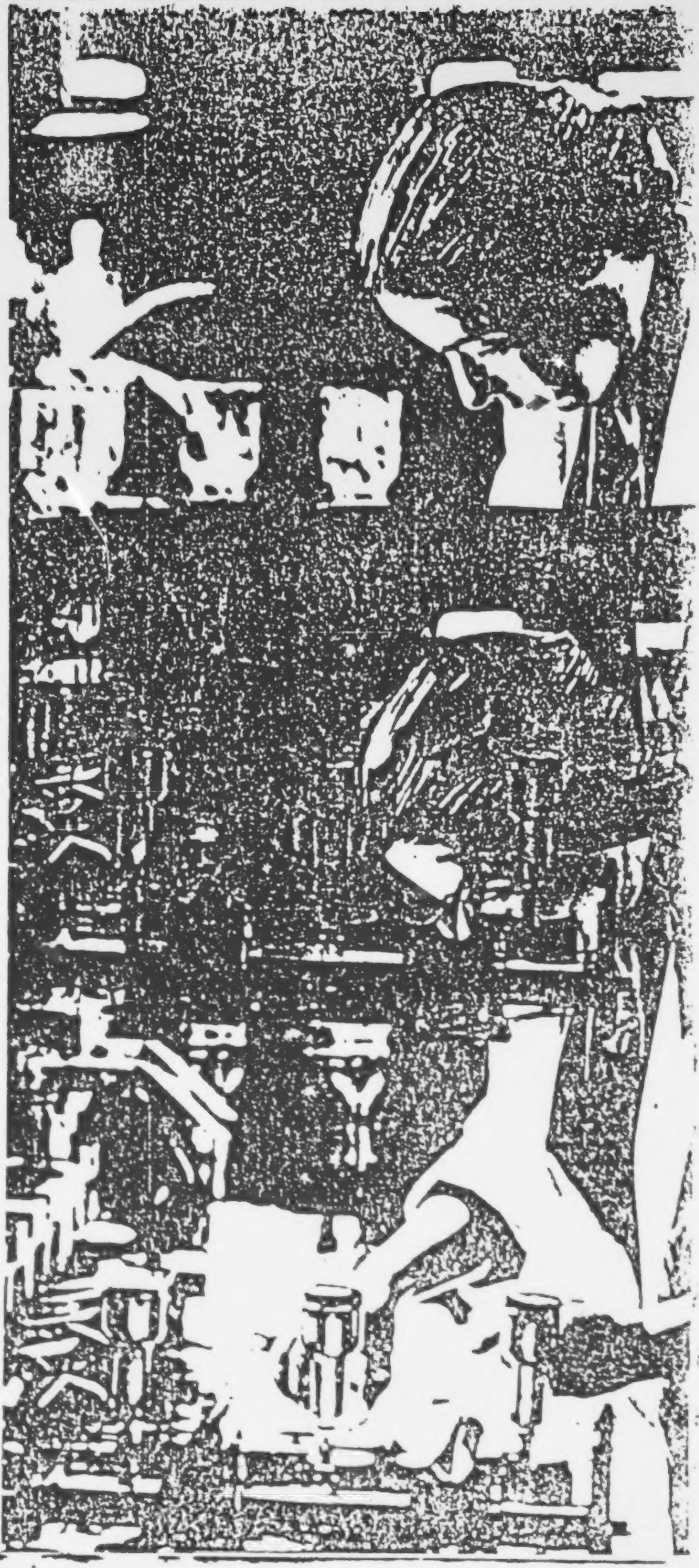
by Larry Persily
and
Phyllis Lehmann

A haven for the ill and injured, a hospital is full of potential hazards for the men and women who work there.

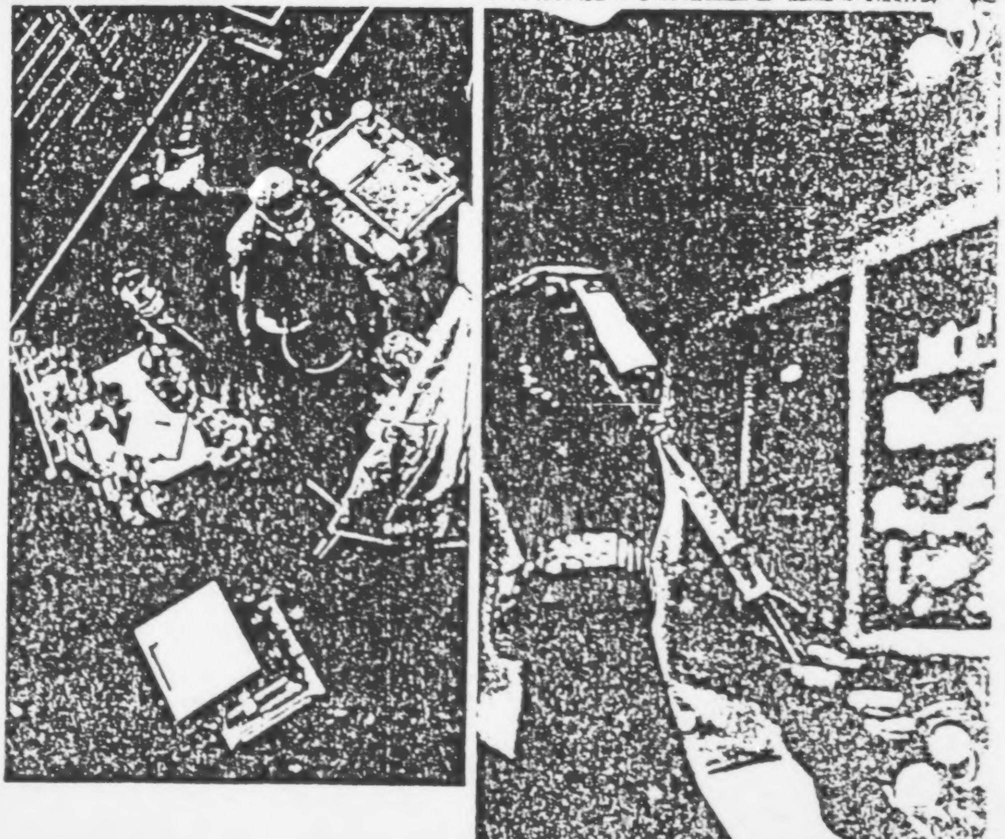
Welcome to the hospital. The place where patients get treatment for their ills—and employees too often get back strains, needle punctures, electrical shocks, exposure to noxious gases, drugs, radiation, and virtually every infectious disease that comes down the pike.

Ironically, the very equipment, substances, and procedures needed for curing illness and mending injury pose innumerable dangers to employees—from medical specialist to janitor.

The hospital is a workplace for 2,732,000 Americans. Another 1,671,000 work in nursing homes, clinics, and other health service institutions with hazards similar to those in the hospital. Because the patient has always been the primary concern of hospitals and hospital organizations, the employee has reaped little attention. Consequently, no wide-scale survey of hazards to employees or of hospitals' attempts to deal with hazards was ever conducted until the National Institute for Occupational Safety and Health (NIOSH) accepted the challenge two years ago.



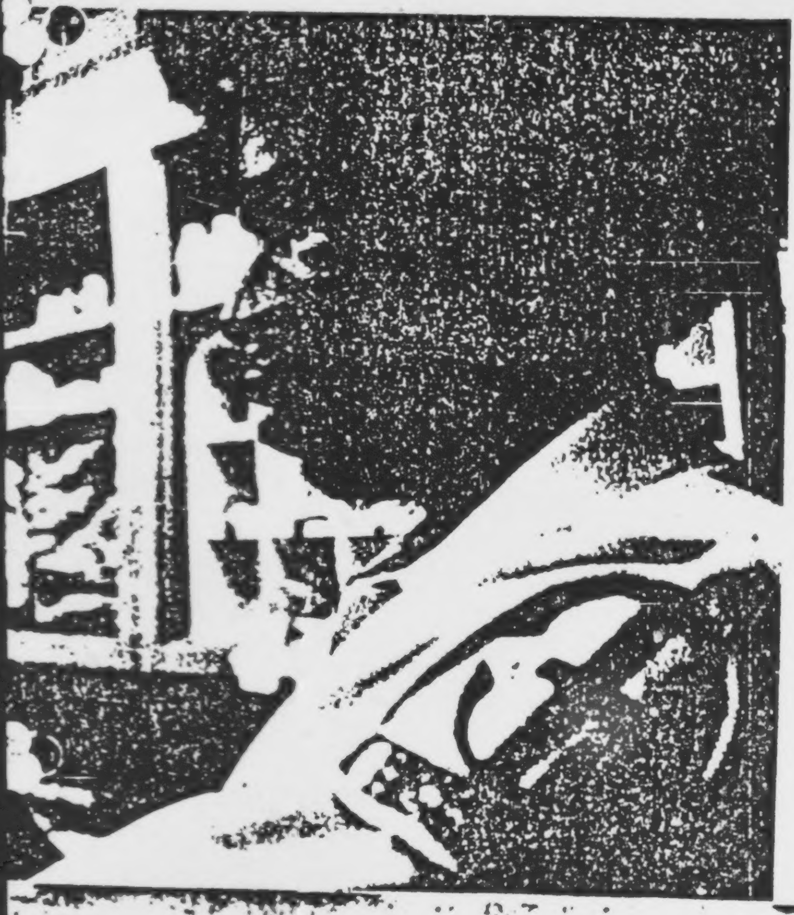
Radiation, vital in patient diagnosis and therapy, can be hazardous to employees. In this diagnostic lab, the doctor beside the patient wears a protective lead vest. The technician is shielded from exposure by a partition.



Anesthetic gases that leak into the air in operating rooms have been linked with miscarriages and abnormal offspring among nurses who administer anesthesia while pregnant.

NIOSH queried some 3,700 hospital administrators about the most common causes of injuries and illnesses, their employee safety and health programs, and maintenance of employee health records. Replies have been received from about 74 percent of the hospitals and, when tabulated, they should give the first comprehensive picture of employee safety and health in the nation's hospitals. The first of NIOSH's reports on the survey is still incomplete, but preliminary analysis of the returned questionnaires shows that worker safety and health is a field many hospital administrators simply do not understand—in some cases not even well enough to respond properly to NIOSH's questions.

Formal survey or no, it is possible to compile quite a laundry list of hazards in hospitals. Ask the people who work there, the safety coordinators who must convince their bosses the hazards are worth worrying about, the insurance companies who pay the bills for injured or ill employees, and such groups as the National Safety Council, and you come up with very nearly the same list. Almost always heading the list of common injuries are back strains, falls, and needle punctures.



Needle punctures are high on the list of common hospital injuries. Because punctures can spread infection, proper needle disposal programs are a must

"Back injuries are our biggest problem," says Jack Edmands, safety director at the 1,600-employee Mt. Zion Hospital and Medical Center in San Francisco. "They account for 48 percent of our workmen's compensation costs."

Back strains caused by lifting patients and moving beds are especially prevalent among nurses and nurses' aides. Cheryl Lehmann, a nurse at a 500-employee private hospital near Harrisburg, Pennsylvania, says, "Umpteen of the women I work with have back problems. We do have to do a lot of lifting, but if there's no orderly around and you're helping a patient and he faints, what are you going to? You can't just let him fall."

Unfortunately, a lot of falling in hospitals is also done by the staff. Safety officials rank falls among the most severe, as well as the most common, hospital injuries. "If we have to give a pain shot or if a patient is calling, we can't wait for a wet floor to dry before going back to a room," says nurse Lehmann. "So, we have to be sure to tell the janitorial staff to scrub only one half of a hallway at a time and to let it dry before doing the other half. That way we always have a dry surface to walk on."

In some cases, the safe solution to floor problems is not the most practical—or inexpensive—one. "It's very difficult for me to get together with the housekeeping people to decide on a proper texture for an inclined tunnel floor between buildings," says Roger Camplin, safety coordinator at Chicago's Rush-Presbyterian-St. Luke's Medical Center. "Anything that offers really good traction is very difficult to keep clean. We've pulled our hair out quite a bit over this problem." Finally, he reports, they agreed on a very fine, abrasive paint that is expensive and wears down quickly. The price of safety will be more frequent and costly repainting.

Disposable hypodermic needles have been a boon to modern medical care, but when hundreds of needles are used in an average day in a large city hospital, proper disposal is crucial. Needle punctures are a potential health hazard because they can spread infectious diseases.

Camplin uses signs to remind employees to dispose of needles properly and to announce to all in an area that a worker was injured because of a carelessly discarded needle. "Proper needle disposal takes time," he says. "If that box isn't right there in front of the employees, they might throw the needle away in the waste container. They might lay it in the linen. They might drop it and kick it under the bed. It's a difficult problem."

At Mt. Zion in San Francisco, Jack Edmands reduced needle injuries by 58 percent in two years by instituting a system for collecting and destroying all used needles and syringes and removing them to a special area so that no maintenance people ever lay hands on a needle while emptying waste cans. The needle disposal program is also largely responsible for the low infection rate at Mt. Zion, Edmands believes.

The emergency nature of hospital work may be responsible for many of the falls, needle punctures, and other accidents because employees hurrying to aid a patient often do not take proper precautions. This is especially true in areas such as the emergency room or operating room, where speed literally means the difference between life or death. In the operating room, more than anywhere else, accidents are caused by speed and demand, Roger Camplin contends.

"You get cases where a doctor uses one instrument after another, and he inadvertently hands an instrument to an aide in the wrong way, and she gets cut. Or when he hands it, he lets go, and if her hand isn't there to take it, the instrument falls on her foot." Camplin believes this kind of accident could be prevented "if we could slow down a bit. But when a surgeon is concentrating the patient, he's not thinking about wheth there's a hand there to grab the scalpel, cause he's got the suture in there now."

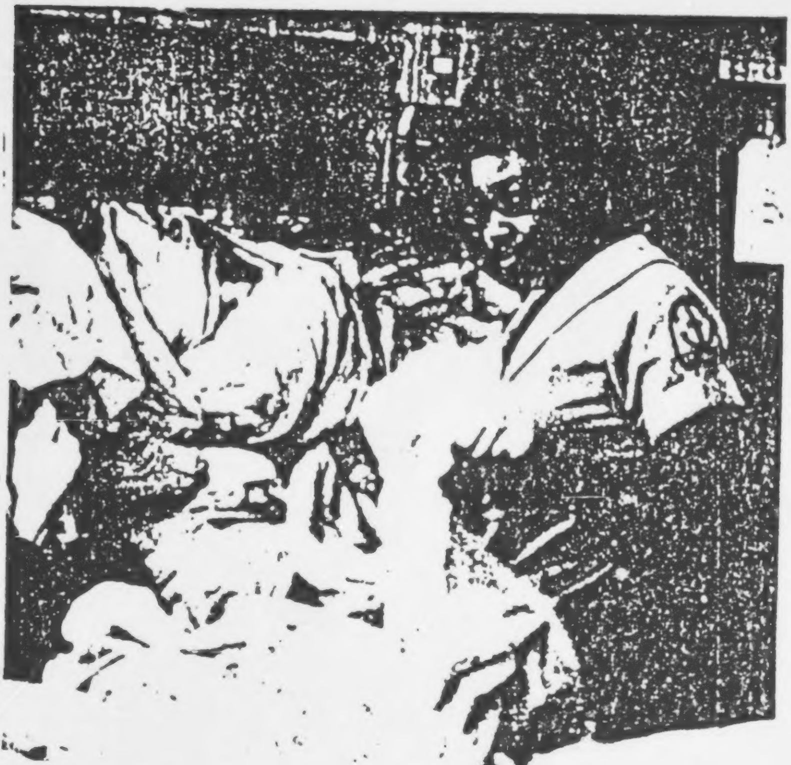
Spending every working day in a building full of sick people obviously exposes hospital workers to a variety of health hazards. Infections, for instance, can be transmitted not only by needles and contact with patients but also by contact with contaminated linens, operating room wastes, blood samples, and body wastes. A major spot where infection can occur is the hospital laboratory, where technicians are exposed to specimens taken from patients.

The problem of infection receives perhaps more attention than other hazards, if only because the Joint Committee on Accreditation of Hospitals requires each accredited hospital to have an infection control committee. Yet, the threat of mass infection keeps pace with efforts to control it. Many hospitals worry especially about hepatitis, a highly infectious liver inflammation that can be fatal.

"There is a tremendous increase in hepatitis everywhere, and hospitals are experiencing great numbers of hepatitis cases amon their employees," says Judy Berek, coordinator of health professionals for the Natio Union of Hospital and Health Employees. "Often there are inadequate provisions in the hospitals for labeling, transporting, and disposing of contaminated specimens."

The newly-organized union, which represents some 70,000 hospital workers, mostly in the New York City area, is working with management at the New York University Medical Center to control exposure to hepatitis, mainly among lab technicians who handle blood plasma. A special group, consisting of representatives from various departments of the hospital, meets monthly to make recommendations for eliminating exposure to infectious diseases and to plan in-service training for employees.

For example, lab workers are being encouraged to use automatic equipment rather than mouth suction to draw liquids into small glass tubes, called pipettes, commonly used in laboratories. Laboratory floors now are scrubbed more often. Garbage cans that were often overflowing have been replaced by more substantial cans with plastic liners. Pointing out that a technician could contaminate a sink faucet when washing his hands after touching a broken or spilled t tube, the group suggested that lab sinks operated by foot pedals. Some lab uniforms



Hospital laundry can harbor infection, as well as needles that have been carelessly dropped can't be taken off easily or worn over street clothes, so employees often take coffee breaks while wearing their uniforms on which infected materials may have been spilled. The NYU group has agreed that employees should have a say in deciding what kinds of uniforms will be worn.

In many cases, the less skilled workers responsible for disposing of contaminated materials run a greater risk of infection than the professionals who know better what precautions to take. Until proper controls are instituted, some unions seek what benefits they can for members.

An official of the Laborers' International Union, which represents some 30,000 hospital service employees, reports that some workers get hazardous duty pay because they must handle contaminated materials. He tells of an almost ludicrous situation at a large federal hospital where workers who handle wastes at several points in the disposal process receive extra pay, but the workers who transport the wastes through a tunnel to the incinerator have not been granted the pay—presumably because the hospital hopes soon to eliminate the risk of infection altogether.

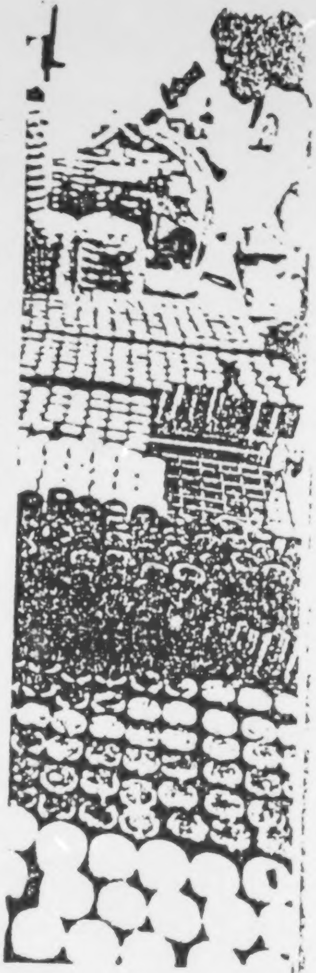
There are other, more insidious, health hazards in the hospital that are just beginning to be recognized. Among the most controversial are anesthetic gases that leak out into the operating room during surgery. Studies in the United States and in other countries show that nurse anesthetists who work in the operating room during pregnancy have two to four times the expected rate of spontaneous abortions. A recent study by Dr. Thomas H. Corbett, of the Veterans Administration Hospital in Ann Arbor, Michigan, and the University of Michigan Medical Center, showed that 16 percent of children born to mothers administering anesthesia during pregnancy had at least one birth defect. Only six percent of children born to mothers not working in the operating room while pregnant suffered birth defects.

Dr. David Bruce, associate professor of anesthesiology at Northwestern University Medical School, also worries about the effects of regular exposure to anesthesia on the performance and vigilance of operating room personnel. He found that exposure to anesthesia in the same amounts commonly found in operating room air affected the ability of volunteer subjects to recognize changes in sensory input and increased their reaction times in some tests by as much as 50 percent. These findings, says Bruce, raise the question of whether an anesthesiologist or anesthetist is always alert as he or she should be in the operating room or in personal tasks, such as driving home from work. He notes that it is possible now to eliminate about 95 percent of the waste gases from the operating room through engineering controls. But a survey by the American Society of Anesthesiologists shows that as of August 1973, four out of five of the nation's operating rooms were not equipped with control systems. Another survey of 50,000 operating room employees by the Society and NIOSH should yield valuable data about the extent of anesthesia hazards.

News about hazards to the offspring of women working in operating rooms has focused attention on the pregnant employee elsewhere in the hospital. One purpose of the NIOSH hospital survey is to find out how many hospitals have formal programs for early reporting of pregnancy (the first three months are the most crucial where damage to the fetus is concerned), for reassignment to safer areas, and for medical clearances for continued employment. In some hospitals it is standard practice, for example, to transfer pregnant employees from the pediatrics ward, where they risk exposure to German measules, a disease that can cause serious birth defects if the mother contracts it early in pregnancy. Authorities agree that pregnant women also should avoid lifting and exposure to drugs, germicides, x-rays, and radioactive materials such as the isotopes used in various diagnostic and treatment procedures.

There is a lot more to a hospital than just working with patients, and the almost endless list of potential hazards extends into service areas such as the kitchen and laundry. Roger Camplin cites the kitchen as one of the most hazardous areas in the hospital because of the output expected and the assortment of appliances and sharp objects that must be used. And inevitably, efforts to provide better service create new hazards. "Hot food in the hospital is a real rarity," says Judy Berek of the Hospital Workers Union, "so some hospitals have installed microwave ovens on each floor. The food is brought up cold and popped in the ovens for a few minutes, then served to the patients immediately. However, we're worried about a possible radiation hazard to food service employees who stand there in front of the ovens putting in and taking out the trays."

Today many hospital laundries are highly mechanized, but hot pipes and hot liquids,



Lab technicians, who handle a wide variety of specimens from patients, are exposed to such dangerous infectious diseases as hepatitis.

rotating machinery, and electrical equipment still are hazardous. According to Bruce Wright, business representative for Local 46 of the Building Service Municipal Employees' Union at Chicago's Cook County Hospital, ventilation in laundry rooms is frequently a problem, especially in summer when heat from the outside combines with the steam inside. Laundry workers also run the risk of electrical shock because they are often standing in water while working around electrical equipment.

Electrical hazards, of course, are common throughout the hospital, especially in the intensive care units full of electrically-operated life-support equipment. Sometimes, patients bring electrical hazards with them. A Texas hospital reported recently that patients come armed with electric clocks, coffee pots, heating pads and blankets, hair dryers, televisions, radios, and electrical toothbrushes. Each appliance must be checked for defective wiring and cords that could cause an electrical or fire hazard.

All of the hazards are compounded by the fact that many hospitals are not just single structures but entire complexes containing hospital buildings, clinics, and medical and nursing schools. "We extend ourselves more and more as the medical center grows," says Roger Camplin of the 20-building Rush-Presbyterian-St. Luke's Center. Some of the older units "are just not made for 1973 health care," so Camplin is looking very closely at wiring, for example, to see if it meets OSHA requirements.

The labyrinths of tunnels beneath some of the large complexes invite security problems for employees. Bruce Wright says that workers at the 6,000-employee Cook County Hospital often are robbed in the tunnels at night. Other hospitals report security problems in such areas as emergency rooms, which by necessity must keep their doors open.

Hospital safety coordinators admit their jobs are not easy. Insufficient employee training, employee reluctance to use some protective equipment, haste, demand for output, and high turnover—especially among less skilled, lower-paid employees—all contribute to accidents in hospitals. But, says Camplin, "We're doing a darn good job. Yes, I could go out and spend a quarter of a million dollars if I had the money, but in the meantime, we're not ignoring safety and health."

Despite a shortage of funds, there are things that can be done or issued without tremendous expense—for example, guidelines on lifting, programs for proper needle collection, badges to show how much radiation x-ray department employees have been exposed to, and non-slip shoes for nurses, operating technicians, and other workers.

Employees themselves often have a better idea. Bruce Wright points out that "90 percent of the time when a janitor comes in, he has to go down to the housekeeping department to get protective equipment such as gloves or goggles. I think there should be housekeeping closets on each floor to stock the protective equipment the employees need, because otherwise they might be tempted not to use it."

Large or small, requiring substantial expenses or common sense solutions, the safety and health problems in hospitals are getting increased attention. The passage of the Occupational Safety and Health Act and the creation of OSHA apparently have helped. Roger Camplin explains that it is possible for safety and health to be given too low a priority and thus "not recognized the way it should be." But, he adds, having OSHA around helps the safety coordinator stress the importance of safety and health to hospital administrators.

Simply being questioned about employee safety and health has alerted some administrators to the need for action. Jane Lee, assistant chief of NIOSH's Medical Services Branch and director of the NIOSH hospital survey, reports that after receiving the survey questionnaire, several hospitals requested aid and advice from NIOSH in setting up employee safety and health programs.

Help also is available from such organizations as the American Hospital Association (AHA) and the National Safety Council. The Council presents a course on hospital safety and makes available to its members a variety of slide shows, booklets, and posters. The AHA sponsors institutes and distributes guidelines on solving safety and health problems and on preparing for an OSHA inspection.

The problems are far from solved, but hospitals are working to make sure that the patient is not healed at the expense of their own employees' safety and health. As Jane Lee says: "Hospitals are just now beginning to be recognized as an 'industry' with an obligation like other industries to provide safety and health programs and decent working conditions for their employees."

Mr. Persily is a free lance writer. Ms. Lehmann is associate editor of JOB SAFETY & HEALTH.

TEACHER NOTES for
ACTIVITY V-IV-B

In addition to the activity provided, have the students assign people in the class to the jobs listed in #2. As workers with those job titles have them discuss the problem of back strain in the hospital and how to reduce it (include a couple of students as coming from the Workmen's Compensation Commission and one or two as patients). It might be instructive to have the students note what is the sex of people they are assigning to certain job titles. For example, in the case of back strain, it is better for a nurse to be stronger. Males are usually stronger than females, but nurses have classically been females.

D R A F T

VI - Quality of Life and the Urban Environment

ACTIVITY VI-I-A-1 thru 5

An Ideal Environment ... includes:

1. full span of life
2. free from any period of illness or disability
3. realize full biological potential
4. satisfaction of roles in society
5. possible to obtain pleasure and satisfaction

The phrase "ideal environment" is a "basis for estimating to what extent any given environment may be less than optimal for any given person, and for comparing environments in terms of their effect upon individuals or groups of individuals".

Classify the following environmental conditions/factors according to how they would redeuce the environment to less than ideal. The lowest # subsumes the other numbers. Explain your answers.
(Example: Carbon monoxide in the air -- #2. At a high enough concentration, but common in the urban environment, CO causes dizziness, ~~the~~ slowdown of reaction times, nausea, drowsiness. It subsumes #3, 4 and 5 in that skills could not be used that might be potentially used, because of impaired reaction times, dizziness, drowsiness. This decreases satisfaction of roles and pleasures ~~ax~~ or satisfaction.)

1. noise in the subway:
2. peeling paint on walls of apartment
3. unemployment
4. litter on the streets

(continued)

5. breathing in asbestos

6. heat wave

7. lead in the water supply

8. working in a factory where you are exposed to beryllium

9. alcoholism

10. loss of hearing

11. the only park near your residence is 5 blocks away

12. smoking cigarettes

13. failing ~~ixx~~ a class

14. smog

15. pesticide residues on fresh fruit in the market

16. being overcharged for cosmetics

17. low water pressure in your apartment

18. eating a fish that has accumulated mercury in its tissues

19. drug addiction

20. in a traffic accident that requires 4 days stay in the hospital

Basic Needs for Humans

Introduction:

According to a recent publication by the EPA, basic needs for humans include:

a. material goods which are safe, durable and easy to handle

b. safe, public association with human beings

c. accessable open spaces for play or contemplation

d. trustworthy information media

e. time to be rich, idle or creative

A. Look at the picture depicting an urban environment.

1. Is it in the past, present or future?

What is (are) the reason(s) for your answer?

2. List the pictured sources of the following consumer goods:

a. food

(continued)

b. clothing

c. shelter

d. energy

e. transportation

3. What are the biggest (most significant) changes in the items in #2 with which you are currently familiar?

(continued)

3. (continued)

4. List the occupational health hazards noted in the picture:

5. List some other health hazards:

(continued)

B. Evaluate the picture.

1. To what extent does this environment meet the basic needs for humans (where not depicted, indicate in your answer): Give at least one example for each.

   a. material goods which are safe, durable and easy to handle

   b. safe, public association with human beings

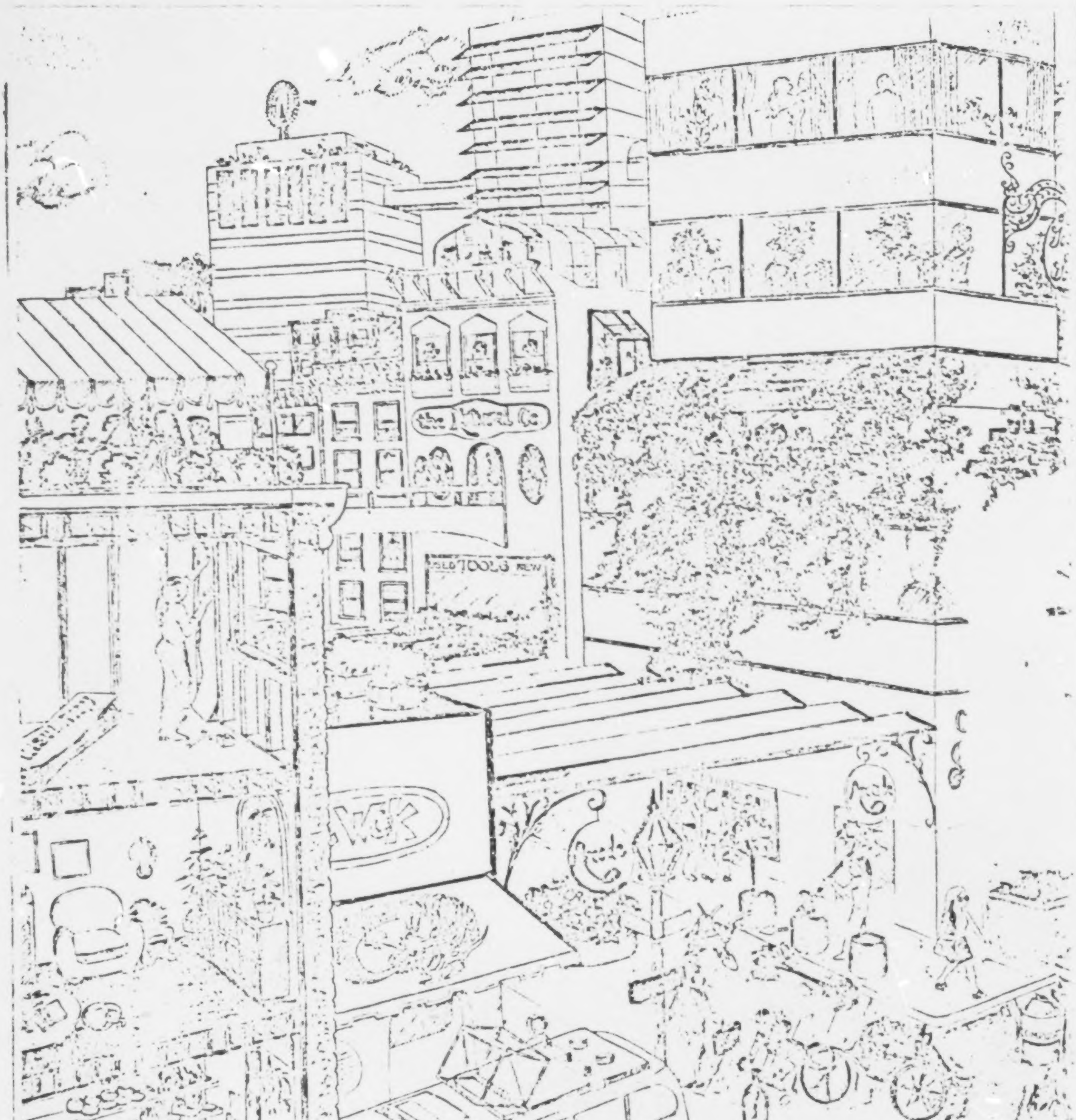
   c. accessable open spaces for play or contemplation:

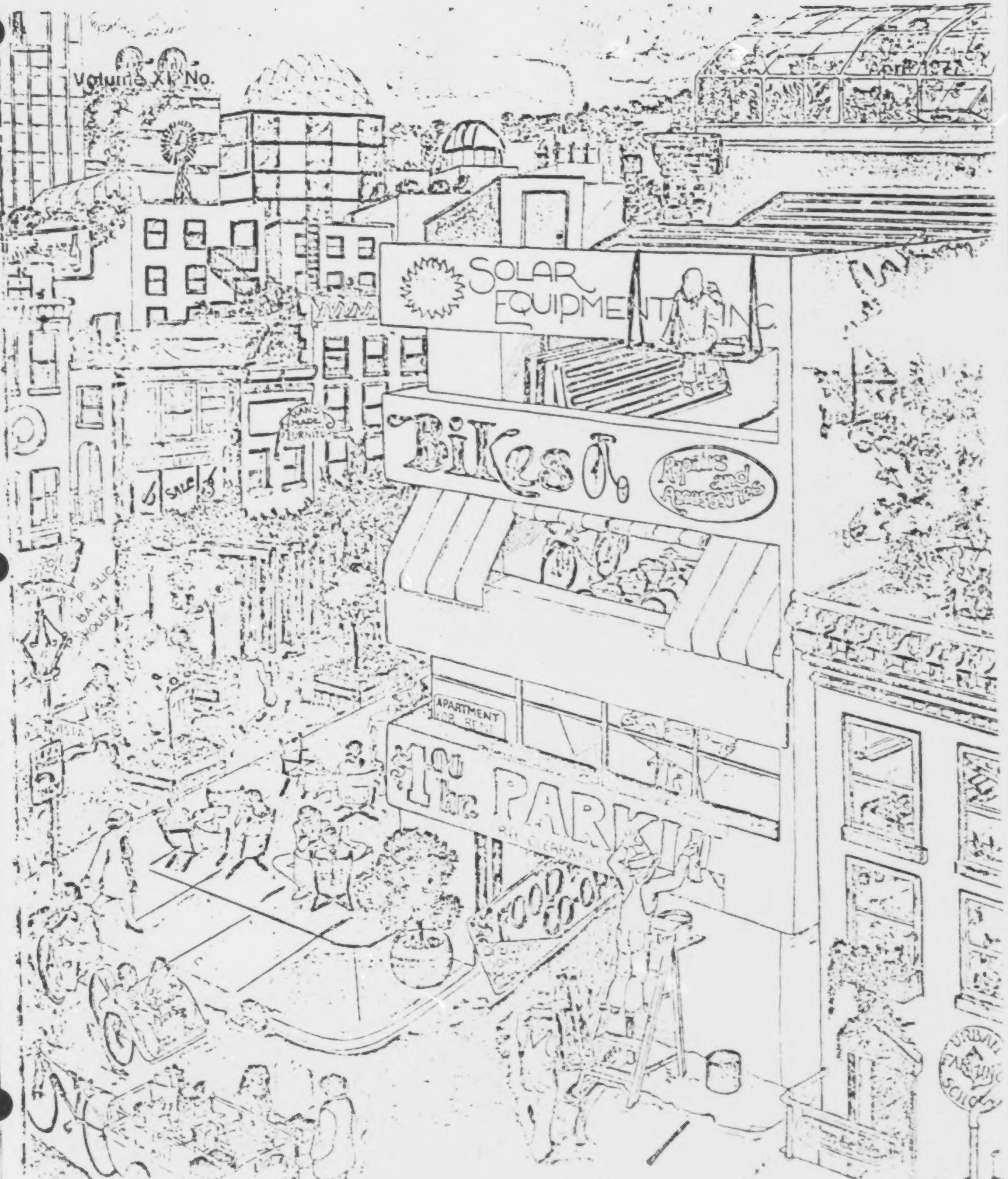
(continued)

d. trustworthy information media:

e. time to be rich, idle or creative:

2. How does the urban environment of the picture compare to the environment of the city in which you live, with regard to each of the items (a thru e) listed in #1?


the Floral Co
USED TOOLS NEW
ICE CREAM
YIELD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ACTIVITY

Does one live to eat or does one eat to live?

Eating is a fact of life! One must have nutrition in order to live. How much you eat is related to a variety of circumstances, some cultural, some economic, some based on the individual personality and taste.

A recent study in Harlem indicates that "nutritional problems, chiefly obesity" is the sixth most important health problem among adolescents.

1. Examine the height and weight chart that your teacher has.

2. Weigh yourself on the scale in the classroom.
   Measure your height with the assistance of a classmate.

   Height __________ Weight ________

   From the chart, what should your weight be ____________.

   According to the chart how many pounds are you over or under weight?

   ____

Why do I eat INVENTORY

One of the important reasons people eat is related to psychological and social satisfaction they receive from eating. Usually we do not stop to think about why we eat -- we just eat when we eat! Sometimes stepping back to look at ourselves, helps us to understand ourselves better.

This activity will hape you get a picture of some of your personal reasons for eating. The insight may lead to some desirable changes in your eating behavior.

Attached are some statements made by people which describe what they get out of eating. How often do you feel this way about eating? Circle one number for each statement. Answer every question (this is important).

18

Why Do I Eat Inventory[1]

add that
new foods +
additives come with the foods -

PURPOSE

The purpose of this inventory is educational in nature. It should help you gain insight into the psychological satisfactions you receive from eating. These insights could help you change your eating patterns, thereby reducing caloric intake.

DIRECTIONS

Here are some statements made by people to describe what they get out of eating. How *often* do you feel this way about eating. Circle one number for each statement. *Important: answer every question.*

---

[1] This inventory and interpretation is adapted from *Smoker's Self-testing Kit*, PHS Publication No. 1904, 1969, developed by Daniel Horn, Ph.D., Director of the National Clearinghouse for Smoking and Health of the Public Health Service and members of the Clearinghouse staff.

	Always	*Frequently*	*Occasionally*	*Seldom*	*Never*
A. I eat to keep myself from slowing down	5	4	3	2	1
B. Handling food is part of the enjoyment of eating	5	4	3	2	1
C. Eating is pleasant and relaxing	5	4	3	2	1
D. When I feel angry about something, I eat	5	4	3	2	1
E. When I run out of my favorite foods I find it almost unbearable until I can get more	5	4	3	2	1
F. I eat automatically without even being aware of it	5	4	3	2	1
G. I eat to stimulate me, perk myself up	5	4	3	2	1
H. Part of the enjoyment of eating comes from the steps I take to prepare it	5	4	3	2	1
I. I find eating pleasurable	5	4	3	2	1
J. When I feel uncomfortable or upset about something, I eat	5	4	3	2	1
K. I am very much aware of the fact when I am not eating	5	4	3	2	1
L. I eat without realizing what I am doing	5	4	3	2	1
M. I eat to give me a "lift"	5	4	3	2	1
N. When I eat, part of the enjoyment is seeing, smelling, and tasting food	5	4	3	2	1
O. I want food most when I am comfortable and relaxed	5	4	3	2	1
P. When I feel "blue" or want to take my mind off cares and worries, I eat	5	4	3	2	1
Q. I get a real gnawing hunger for food when I haven't eaten for a while	5	4	3	2	1
R. I've found food in my mouth and didn't remember putting it there	5	4	3	2	1

SCORING

1. Enter the numbers you have circled to the test questions in the spaces below, putting the number you circled to question A over line A, to question B over line B, and so on.
2. Total the three scores on each line to get your totals. For example, the sum of your scores over lines A, G, and M gives you your score on "Stimulation"–lines B, H, and N give you the score on "Handling," and so on.

						Totals
____	+	____	+	____	=	____________
A		G		M		Stimulation
____	+	____	+	____	=	____________
B		H		N		Handling
____	+	____	+	____	=	____________
C		I		O		Pleasurable relaxation
____	+	____	+	____	=	____________
D		J		P		Crutch: tension reduction
____	+	____	+	____	=	____________
E		K		Q		Craving: psychological addiction
____	+	____	+	____	=	____________
F		L		R		Habit

Scores can vary from 3 to 15. Any score 11 and above is high; any score 7 and below is low.

INTERPRETATION

What kind of eater are you? What do you get out of eating? What does it do for you. This instrument is designed to provide you with a score on each of six factors that describe many people's eating patterns. Your eating may be well characterized by only one, or by a combination of factors. In any event, this inventory will help you identify why you eat other than to satisfy your hunger, and what kind of satisfaction you think you get from eating.

The six factors measured by this instrument describe one or another way of experiencing or managing certain kinds of feelings. Three of these feeling states represent the *positive* feelings people get from eating: (1) a sense of increased energy or *stimulation*, (2) the satisfaction of *handling* or manipulating things; and (3) the enhancing of *pleasurable feelings* by reducing the state of tension or feelings of anxiety, anger, and shame, for example. The fifth is a complex pattern of increasing and decreasing "craving" for eating representing a psychological *addiction* to food. The sixth, *habit*, is eating that occurs in an absence of feeling–purely automatic eating.

A score of 11 or above on any factor indicates that this factor is an important source of satisfaction for you. The higher your score (15 is the highest), the more important a particular factor is in your eating and the more useful the discussion of that factor can be in your attempt to cut down on eating.

A few words of warning: if you cut down on eating, you may have to learn to get along without the extra satisfactions that food gives you. Either that, or you will have to find other acceptable ways of getting these satisfactions. In either case, you need to know just what you get out of eating before you can decide whether to forego the satisfactions, or find another way to achieve them.

1. *Stimulation.* If you score high or fairly high on this factor, it means that you are stimulated by food–you feel that it helps wake you up, organize your energies, and keep you going. If you try to give up eating, you may want a safe substitute: a brisk walk or modest exercise, for example, whenever you feel the urge to eat. Try chewing gum or eating celery or carrot sticks.
2. *Handling.* Handling things can be satisfying, but there are many ways to keep your hands busy without placing food into your mouth. Why not toy with a pen or pencil? Or try doodling. Or play with a coin, a piece of jewelry, or some activity other than eating like knitting, crocheting, painting, or working with handicrafts.
3. *Accentuation of Pleasure–Pleasurable Relaxation.* It is not always easy to find out whether you use food to feel *good*, that is, get honest pleasure out of eating (factor 3) or to keep from feeling *bad* (factor 4). Those who get pleasure out of eating often find that an honest consideration of the harmful effects of their habit is enough to help them quit. They substitute chewing gum, drinking fluids, or participating in social and physical activities. With these methods, they find they do not miss the excess food they are not eating.
4. *Reduction of Negative Feelings or "Crutch."* You may be using eating as a kind of crutch in moments of stress or discomfort, and on occasion it may work; food sometimes is used as a tranquilizer. But if you are an excessive eater who tries to handle severe personal problems by snacking many times a day, sooner or later you will discover that foods do not help you deal with these problems effectively.

   When it comes to cutting down, you may find it easy to do so when everything is going well, but you may be tempted to start excessive eating again in a time of crisis. Again, physical exertion, chewing gum, drinking fluids, or engaging in social activity may serve as useful substitutes for eating, even in times of tension. Your choice of a substitute depends on whether the activity will achieve the same effect without having any appreciable risk.
5. *"Craving" or Psychological Addiction.* Stopping excessive eating will be difficult for you if you score high on the "Psychological Addiction" factor. Probably for you the craving for food will continue to build up as your plate begins to empty. To be successful in changing your desire for excess food, you must go "cold turkey"–that is, cutting off extra helpings completely.

   You will have to isolate yourself from your favorite rich foods, second helpings, and snacks until the craving is gone. Giving up excess food intake may be so difficult and cause such discomfort that once you do cut down, you will find it easy to resist the temptation to go back to excessive eating.
6. *Habit.* If you are a habit eater, you probably are not getting much satisfaction from your food. You probably just eat without realizing you are doing so. You may find it easy to control caloric intake if you can break the habit patterns you have built up. Cutting down gradually may be quite effective if there is a change in the way the food is served and the conditions under which you eat. An example of this might be serving the food from the pots on the stove rather than from bowls on the table. This will make piling on "seconds" a conscious effort. The key to success is becoming *aware* of all calories you eat. This can be done by asking yourself, "Do I really want this food?" You may be surprised at how often you do not really want the extra calories.

SUMMARY

If you do not score high on any of the six factors, chances are that you are not an excessive eater. If so, cutting down calories should be easy.

If you score high on several categories, you apparently get several kinds of satisfaction from eating and will have to find several solutions. Certain combinations of score may indicate that reducing food intake will be especially difficult. Those who score high on both factor 4 and factor 5, "Reduction of Negative Feelings and Craving," may have a hard time cutting down caloric intake. However, there are ways to do it; many excessive eaters represented by this combination have been able to cut down on caloric intake.

Others who score high on factors 4 and 5 may find it useful to change their patterns of eating and cut down at the same time. They can try to eat foods that are lower in calories, such as carrots, fresh fruits, Ry-Crisp, or to substitute exercise and other physical activities for eating. After several months of trying this solution, they may find it easier to develop a habit pattern of low-calorie intake.

You must make a decision to cut down caloric intake either by (1) substituting appropriate volumes of less fattening foods for the high calorie foods currently in your diet, or (2) reducing or eliminating excess calorie food (like junk foods) from your diet without the substitution of low calorie foods.

ACTIVITY

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COURSE OUTLINE

- I. The Urban Ecosystem
  - A. Physical - Chemical - Biological
    - 1. Food webs and chains
    - 2. Biochemical cycles
    - 3. Energy flow
  - B. Socioeconomic -Psychological
    - 1. Roles - niches
    - 2. Habitat
    - 3. Adaptation
- II. Environmental Pollution
  - A. Where it comes from
    - 1. Production Methods
    - 2. Consumer patterns
  - B. Comparison of large urban picture
    - 1. National
    - 2. International
- III. Environmental Health
  - A. Definition
    - 1. Environmental factors
    - 2. Urban health problems
  - B. Conditions of Health
    - 1. rate of mortality
    - 2. rate of disability
    - 3. effects on growth and development

(continued)

4. constraints on behavior

5. pleasure and satisfaction received

IV. Quality of Life in Urban setting as affected by Environmental Factors

A. What is "quality of life"

1. needs

2. attitudes

B. Risk and adaptation - Its relationship to life

1. values

2. goals

3. desires

Course Outline

- I. Physical Health
  - A. Methods of Entry
    - 1. Inhalation
    - 2. Contact
    - 3. Ingestion
    - 4. Multi-entry
    - 5. Injection (IM, IV)
  - B. Organ Systems
    - 1. Circulatory
    - 2. Respiratory
    - 3. Digestive
    - 4. Nervous
    - 5. Urogenital
  - C. Categories of Environmental Pollution: The effects on physical health
    - 1. Systemic
    - 2. Local
    - 3. Where sequestered
  - D. Interaction of Organic systems with Environmental Pollutants
    - 1. Toxicology
    - 2. Epidemiology
    - 3. Clinical Effects
- II. Mental Health
  - A. Categories of Environment that effect Mental Health
    - 1. Self-esteem
    - 2. Parenting Practices

(continued)

    3. Family instability - isolation
    4. Loss of Community Involvement - migration, urban renewal, housing projects
    5. Inadequate, crowded housing
  B. Interaction of Environment with Urban Resident
    1. Crime and delinquency
    2. Drug abuse and alcoholism

III. Interactions between mental and physical health and Stage of Life Cycle
  A. Effect of Multiple Factors
    1. Stress
    2. Physical complications of mental illness - respiratory, cerebrovascular, alcoholism, drugs
    3. Mental complications of physical illness - allergy, asthma, depression, senility
  B. Aging
    1. pre-natal to old age

IV. Control
  A. Individual interface with health-care system
    1. attitudes
    2. facilities available
  B. Coping with condition of health
    1. roles - worker, parent, resident
    2. Security - workman's compensation, insurance, welfare, how long can afford to be sick

VI - Quality of Life and the Urban Environment

COURSE OUTLINE

I. Factors in Quality of Life
  A. An Ideal Environment
    1. Full span of life
    2. Free from any period of illness or disability
    3. Realize full biological potential
    4. Satisfaction of roles in society
    5. Possible to obtain pleasure and satisfaction
  B. Basic needs for humans
    1. Material goods which are safe, durable and easy to handle
    2. Safe, public association with human beings
    3. Accessable open spaces for play or contemplation
    4. Trustworthy information media
    5. Time to be rich, idle or creative
II. Attitudes about Environmental Conditions
  A. Basis of attitudes - values, goals, desires
  B. Influence on behavior
  C. Flexibility/Rigidity of views
III. Control
  A. Abilities to control
    1. Personal control of quality of life
    2. Individual/Group gain of control
  B. Social stability - Family and Friends
    1. Influences on values, goals, attitudes
    2. Proximity
    3. Personal control in choice of friends

(continued)

C. Political

1. Civil liberties

2. Stability

IV. Adaptiveness - Dealing with Fluctuations

A. Adaptive behaviors

B. Effect on quality of life

C. Effects of maladaptive behaviors

V - Health Hazards of the Workplace

COURSE OUTLINE

I. Dimensions of the workplace environment
  A. Types of working places
    1. Indoor - office, factory, construction
    2. Transportation - subway, bus, taxi, RR
    3. Outdoors - street, construction
  B. Occupation
    1. Professional/Technical
    2. Supervisors/Managers
    3. Skilled Worker
    4. Non-skilled worker
  C. Workplace effects on neighborhood/community
    1. Worker contamination
    2. Workplace contaminating surrounding air, water, soil
II. Condition of Health
  A. Symptoms of health condition
    1. Acute
    2. Chronic
  B. Cause-Effect relationship between occupation and workplace
    1. One cause/many effects
    2. Many causes/effects
III. Control in reduction of health risk
  A. Self
  B. Small Group - unions, management, public interest groups
  C. Large Group - OSHA, NIOSH, ACGIH
  D. Protective Engineering

(continued)

IV. Economic Issues

- A. Health Insurance
  - 1. Workmen's Compensation
  - 2. Local/national Health Insurance
- B. Risk/Benefit

SETH'S ENVIRONMENTAL HEALTH BULLETIN

Issue No. 1 December 1976

This is the first issue of SETH's Environmental Health Bulletin. We the students of the SETH (Secondary Education Through Health) Program at the Mount Sinai School of Medicine will be publishing the paper monthly to give the community information on pollution. It has been said that pollution is beginning to take its tragic toll, not only in plants and wildlife, but in human beings. We believe that by giving the community information it will help people cope with the problems created by pollution.

Vacant Burned Buildings in the Environment

By: Sonia DeJesus, Wanda Rivera

Vacant buildings should be securely closed and maintained in safe condition or they should be torn down. There are many reasons for the demolition of burned out buildings. (1) Unhealthy to the environment. (2) Dangerous to the community, such as when children play in these buildings. (3) And last but not least they present an ugly appearance.

Unhealthy to the environment:

The National Safety Council advises that children be kept away from abandoned buildings. The danger of playing in such dilapidated structures can't be overemphasized. Broken glass, splintered wood, and protruding rusty nails in such places provide a perfect environment for major injury and infection. Unsafe walls and floors are prone to collapse and crush young children. Rats and other animals that use these places for shelter can transmit serious diseases from a bite or scratch. Some birds, such as pigeons, carry an amazing variety of objects to their nests and are known to carry lighted cigarettes into buildings.

It's dangerous to the community:

Arsonists and vagrants start fire for profit, vengeance or psychological reasons. These buildings must be protected from entry either by adequate well maintained fencing with locked gates or by sealing the buildings. There is the "inside job", a building scheduled to be torn down suddenly burned to the ground. Thus saving the cost of demolition, unfortunately leads to loss of life, injury and destruction of surroundings. Explosions caused by vapor from leaks in underground flammable liquid tanks, gas piping, or abandoned equipment in piping in the building are another hazard. The threat to the neighborhood must be weighed against the cost of protection or demolition.

The legal aspects; what members of the community can do:

National Safety Council President, Vincent Tafany, remarked that those individuals or organizations responsible for such property should rehabilitate or demolish the structure. He also noted, however, that it is necessary for the municipal government to pass and enforce laws that can deal with such matters expeditiously before an imminent public danger is created. Fire commissioner Lowery started a meeting in 1966 about burned out buildings. One result of the meeting was the greatly accelerated program by the demolition section of the housing and development administration to remove unsafe buildings. The Community Relations Bureau of the Fire Department has attempted to seek cooperation of the people of the community to report to the police department about acts of vandalism and unauthorized entrance into these buildings.

Noise on the Subways

By: Yvonne Green, Alice Castro

Students from the SETH Program at Mt. Sinai Hospital has been taking a survey on noise pollution in our subway system. They have been interviewing people on the #6 train downtown, and have found how the people feel about the noise on the trains.

(continued)

** The views of SETH's Environmental Health Bulletin are those of the participating students and not necessarily those of the SETH Program not those of the Mount Sinai Medical Center.

These are some some of the questions we asked people on the subway: How do you feel about noise pollution? How long have you been riding the trains in N.Y.C.? Do you think that noise in this train is bad for your health? How do you feel about noise on the train?

A person who didn't give us his name said,"I feel that sometimes noise pollution is very upsetting and makes people tense. I have been riding the trains for 18 years. I think that the noise is very bad for our health and especially for our hearing."

Jenny, from Manhattan said that, "If the city would put money aside, then we could get the newer trains like the D train, probably there wouldn't be as much noise."

"I've been riding the trains for about 10 years," said Officer McQuarry of Brooklyn. "If people would protest then I think that the city would get us some new trains. The noise did bother me but now I'm used to it."

A. Lloyd of the Bronx said,"I think that the noise in the train is very bad for my ears. I've been riding the trains for 5 years. I think that noise pollution is very bad for our health."

Gene Lewis of Queens answered, "The noise in the train gets me very nervous and my ears get very sensitive to the noise and it gets very difficult for me to hear. I would like new trains which will not be so noisy."

Secondary Education Through Health
Announces
Swine Flu Shots are Here

By: Yolanda Rodriquez, Brenda Bermudez, Ana Moreno, Carrie DeJesus.

Here are some inquiries made by SETH students about the newly arrived swine flu vaccine. There was an epidemic in 1918 which killed 20,000,000 people. The reason they died was because there wasn't any antibiotics to prevent the flu. The reason they came up with the vaccine shots was because the flu virus changes its characteristics every few years. Every change in the virus causes a major outbreak. In order to prevent another drastic disaster the government scientists developed the swine flu shots. The following consist of some questions asked by some students and also the research they looked up.

Where did the swine flu come from?

You probably have heard a good deal about swine flu and swine flu vaccine. You may know for example that swine flu caused an outbreak of several hundred cases at Ft. Dix, New Jersey early in 1976. Before that swine flu had not caused outbreaks among people since the 1920's.

What is expected to happen?

No one can say for sure, however, if an epidemic were to break out, millions of people could get sick. Therefore, a special swine flu vaccine has been prepared and tested which should protect most people who recieve it.

Who should take the shot?

Ages 18 through 65 should take the monovalent vaccine, and people over 65, with chronic diseases should take the bivalent. Children under 18 should not routinely recieve flu vaccine. Please ask about age limitations if this information is not clear. People with fever should delay getting vaccinated until the fever is gone. Also people with known allergy to eggs should recieve the vaccine only under special medical supervision. People who have recieved another type of vaccine in the past 14 days should consult a physician before taking the flu vaccine. Mt. Sinai started giving out the swine flu vaccine Oct.12, 1976. So far a rough estimate of 1,800 people have been innoculated. Mount Sinai was seeing, at the time of this writing, 85 to 100 people daily for the vaccine. Generally people who go to inquire about the vaccine usually end up taking the shot. It is an easy method, and only hurts for a couple of seconds.

For further information please contact one of the following departments of health:

Bronx: 299-3957
Brooklyn: 522-0175
Staten Island: 447-3005
Manhattan: 564-3272
Queens: 523-8102

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SETH'S ENVIRONMENTAL HEALTH BULLETIN

Issue No. 2 January 1977

How Carbon Monoxide Affects Your Health

By: Wanda Rivera and Sonia DeJesus

Carbon monoxide (CO), is the most widespread human poison. Carbon monoxide poisoning is actually a kind of hemoglobin poison. Hemoglobin is the oxygen carrier of red blood cells. In poisoning by CO, suffication takes place because CO has a greater affinity for the hemoglobin than does the oxygen. So hemoglobin can no longer be a oxygen carrier when CO is present.

Source:

Carbon monoxide is a colorless, odorless gas which accounts for more than 51% of the total annual air pollution. This gas is almost entirely a man made pollutant. It comes from incomplete combustion of fuels from transportation that uses gasoline engines, and industries that use fuel such as oil.

This chart was published by the U.S. Department of Health, Education, and Welfare. It lists nationwide sources of carbon monoxide in the U.S. 1968.

Gasoline motor vehicles ------------------------------------ 59.0%
Diesel motor vehicles - 0.2%
Aircraft, railroads, vessels ------ 4.6%
Industrial processes -------------- 9.6%
Agricultural burning ---------- 8.3%
Solid waste disposal --------- 7.8%
Forest fires ------- 7.2%
Stationary sources of fuel combustion ---- 1.9% (wood, coal, fuel oil)
Structural fires, coal refuse burning --- 1.4%

Effects:

Carbon monoxide is extremely dangerous. In Environmental Pollution edited by William A. Andrews, it is stated that just 10 ppm (parts per million) of CO in air is sufficient to cause illness. The breathing of this amount will produce nausea, drowsiness, and dizziness. Within 30 minutes, 1,300 ppm is fatal.

We measured CO at a bus stop, 102 St. and Madison Ave., while the bus was at the stop and as it pulled away from the curb. The results of this experiment under two different weather conditions was:

11-18-76 CO level 8ppm	12-2-76 CO level 5 ppm
Temperature - 40°F.	Temperature - 48°F.
Humidity - 46%	Humidity - 49%
cloudy day	sunny, breezy day

Noise on the Subways - Is the D Train Quieter?

By: Alice Castro, Yvonne Green, Maria Francechis

Students from the SETH Program at Mount Sinai Hospital have been interviewing people on the #6 downtown train. The students found out how the people felt about the noise pollution on the subway. We then turned to the D train, one of our newest trains that makes a little less noise. When we finished gathering information about the D train, we interviewed Niel Armer and Edward Silvas the supervisor at the Public Relations Department at the Transit Authority in N.Y.C. These two men were interviewed over the telephone by SETH students.

Mr. Edward Silvas said that the D train is working out very nicely. Between now and the middle of January of next year (1977), we should have about 1,000 more of these trains designed to make less noise and give the public a more comfortable ride.

We asked Mr. Niel Armer if we would have more new trains in the city. He told us that we should be having a better subway system by next year (1977), also it should for us because we would have less noise to hurt our ears.

** The views of SETH's Environmental Health Bulletin are those of the participating students and not necessarily those of the SETH Program nor those of the Mount Sinai Medical Center.

Students from the SETH Program have also gone out and interviewed people on the D trains to find out how they feel about the new trains.

Jose Rodriquez. Bronx, N.Y.
Question: How long have you been riding the D train?
Answer: I've been riding the trains ever since they came out.
Question: Do you think that the D train makes less noise than the regular trains?
Answer: I think that the noise is less but it needs more improving. Anyhow, it is much better than the regular trains.

Alex Francisco, Brooklyn, N.Y.
Question: Do you enjoy the D trains and why?
Answer: Yes, I enjoy the D trains because the ride is much more pleasant and the environment is prettier, plus there is less noise.

Ana Luz Garcia, Queens, N.Y.
Question: Do you think that the D train is improved and in what way?
Answer: I think that the D train is improved because the ride is noiseless and comfortable, and it looks very nice and pleasant.
Question: Which train do you prefer?
Answer: I prefer the D train because it looks better than the regular train. The decoration is much better and its more fun to ride the train.
Question: Do you think that the train is better for our health without the noise?
Answer: Yes, I think that the noiseless trains is better for our health because it helps us not to become tense or nervous and you feel much more comfortable.

Even If You Don't Smoke, Cigarette Smoke Can Affect Your Health

By: Yolanda Rodriguez, Ana Moreno, Brenda Bermudez

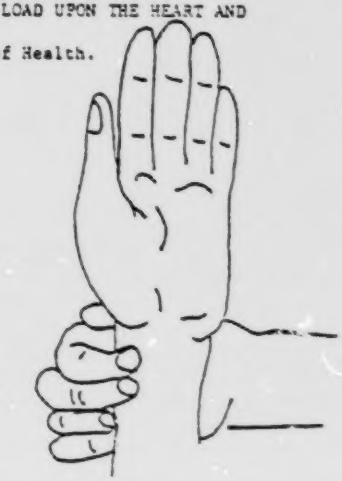
The SETH students made an experiment where six students were smoking in a room that was 194 square feet. We tested the carbon monoxide that was in the room and found it was 8 ppm. In Environmental Pollution edited by William A. Andrews, it is reported that 10 ppm causes nausea, drowsiness, and dizziness (see, in this same issue, the article on how CO affects your health).

The smoking laws in public places are being reinforced because of the many complaints given by nonsmokers. The SETH students called the EPA (Environmental Protection Agency) and were told of various new laws in public places. Smoking is now outlawed in elevators and supermarkets.

Cigarette smoking can even effect the unborn child. Much evidence indicates that cigarette smoking during pregnancy causes a reduction in infant birth weight.

If you smoke: To demonstrate the affect that smoking has upon the heart rate. This is a simple test you can take.
Equipment needed: 1 wrist watch. 1 smoker, cigarettes.
Procedure: It is recommended that you do this experiment on yourself or someone at home and record your findings. The arterial pulse taken at the wrist, is an accurate indication of the heart rate. One can take the pulse by placing two middle fingers of the right hand on the thumb side of the wrist of a volunteer who smokes. (See diagram) The volunteer's pulse should be taken two or three times to establish a base line accuracy. In each instance record the pulse rate as the number of pulsations felt per minute.

Have your volunteer light a cigarette then take the pulse as the volunteer has concluded the third of fourth puff. When the cigarette is finished, take the pulse every fifteen minutes until the pulse rate returns to normal. Chart your findings and determine how many extra heart beats one pack of cigarettes causes the volunteer. Since with each beat the heart pumps approximately 70 gallons of blood, calculate the extra volume of blood that is pumped by the heart induced by smoking one package of cigarettes. The apparent conclusion is that SMOKING PUTS AN EXTRA UNNECESSARY LOAD UPON THE HEART AND SUCH A BURDEN WILL, IN THE LONG RUN, SHORTEN LIFE.
This experiment was put out by the New York State Department of Health.



Take the pulse by placing two middle fingers of the right hand on the thumb side of the wrist.

SETH'S ENVIRONMENTAL HEALTH BULLETIN

Issue No. 3 March 1977

A Look at The New Plastic Bottles

By: Sonia DeJesus, Wanda Rivera

The Coca-Cola bottling company introduced the new 32 oz. plastic container to the metropolitan area in October. Environmentalists have charged that the production of the bottle uses excessive amounts of petroleum, when the nation's energy sources are imperiled. Questions have been raised about its safety and environmental impact. This bottle is highly flammable and gives off toxic gases. This bottle has been known to explode without warning on supermarket shelves.

The growing industry of plastic bottles will increase litter. This bottle is highly flammable and will burn. This solution to the solid waste problem will lead to an increased amount of air pollution. This bottle also produces harmful gases such as acidic gases and hydrogen chloride gas. It also contaminates ground water when disposed of in municipal incinerators and open dumps. Some biodegradable pollutants (see article below) can be rapidly decomposed by natural process or in engineered systems. Some plastics are now being recycled. The plastics consumption of energy is one of the biggest problems in recycling plastic, as is their collection and separation. This bottle must be separated from other types of solid waste because they are all chemically built differently. Researchers are not turning their attention to getting degradable plastics. At this time most plastics are not degradable and last almost forever.

An Article from the Feb. 23, 1977 New York Times

Dr. Irving J. Selikoff, Director of Environmental Medicine at Mount Sinai Medical Center, said vinylidine chloride was closely related to two other cancer causing chemicals, vinyl chloride and trichloro ethylene. Dow Chemical Company said that food wrapped in plastics made from vinylidine chloride showed that none of the chemical migrated from the wrapping to the food. Three years ago, Dr. Maltoni discovered that vinyl chloride causes cancer in rats and mice. Shortly afterward, the chemical was pinpointed as the cause of a rare, fatal liver cancer in exposed workers. In related development, the NRDC asked the Food and Drug Administration to recall existing stocks of Coca-Cola in plastic bottles made from acrylonitrile, also called vinyl cyanide and a chemical relative of vinyl chloride. The agency's decision was based on finding that acrylonitrile causes birth defects and tumors in test animals and small amounts of the chemical leak out of the bottle into the drink.

Editorial Comment:

Plastic has provided us with many good materials. For example, packaging, vinyl hard-tops of your cars, and so on. Through the use of excessive petroleum to produce the plastics, workers are exposed to the deleterious effects of working with petroleum and our air and water supplies are polluted. We think the most important thing now is to find solutions to the problems involved with plastics, even if the production of the plastic bottle will be easier, lighter for the consumer and won't break if dropped. We think we should sacrifice the new plastic bottle and continue the glass bottle.

You Have Probably Wondered Where Your Garbage Goes To

By: Brenda Bermudez, Ana Moreno, Wanda Rivera

In urban areas, solid waste disposal has a number of public health implications. The problems of land pollution by wastes differ in a number of important respects from those of water or air pollution. With the increasing utilization of land for urban development, pressure to dispose of solid wastes by methods other than land disposal has led to new pollution problems.

(continued on page 2)

** The views of SETH's Environmental Health Bulletin are those of the participating students and not necessarily those of the SETH Program nor those of the Mount Sinai Medical Canter.

(You Have Probably Wondered Where Your Garbage Goes To - continued from Page 1)

Biodegradable pollutants such as domestic sewage can be rapidly decomposed by natural processes, such as municipal sewage treatment plants. This is where electrical energy and machines are used to speed up natural decomposition by bacteria. In other words, this includes substances for which there exists natural waste treatments. Problems arise with degradable types when input into the environment exceeds the decomposition disposal or recycling capacities. Severe problems with sewage in cities result from the fact that they have grown faster than treatment facilities. The technology for the treatment of domestic wastes is well developed; it just takes money and a greater public awareness of the necessary prices that have to be paid for a highly populated urban life.

Non-degradables constitute a second major class that includes aluminum cans, long-chain detergents, glass, phenolic chemicals, plastics, and hundreds of man-made materials that do not degrade, or degrade very slowly in the natural environment. In other words, these are substances for which there are no natural decay or treatment processes that can keep up with the rate of man-made input into the environment. Non-degradable products are a part of the "solid wastes" of cities that often end up in landfills. In the future, attempts will be made to separate degradable and non-degradable materials in the solid waste stream, with the former used as fuels and fertilizer and the latter, recycled.

Who recycles:

Cans which are incinerated cannot be recycled. Cans that are in good condition are sold to the recycling companies. A pound of cans is fifteen cents. The cans that you take to these companies have to be clean and put into boxes. At the addresses below, you can take tin or aluminum cans and get money for them:

505 West 27th Street
415 East 45th Street

When you take cans to these places, you cannot get money for the cans, because it is from the community. The Community Centers are:

65 West 91th Street
502 West 121st Street
325 Riverside Drive

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Pollution Can Never Be Swept Off The Earth

SETH'S ENVIRONMENTAL HEALTH BULLETIN

Issue No. 5 May 1977

The people in Manhattan that we asked about what they would like to read about in the bulletin were interested in reading about noise pollution, air pollution, and pollution in our waters so here is our "request" issue.

Alice Castro

THE NOISE METER

BY Diana Ramos
Carrie De Jesus

The bulletin has been taking noise meter readings in the streets and subways. The noise is measured by decibels. A decibel is a unit of measurement for sound This is a logrithmic measure which means that 10 decibels is greater than 1 decibel, 20 decibels is 100 times greater than 10 and so on. The normal sound level is between 30 through 60 decibels.

Here are some of the noise meter readings we made:

1) Normal conversation speech was below 60-62 decibels.
2) In the emergency room, at Mt. Sinai Hospital, where the television was on it was 65-70 decibels.
3) The noise meter was 70-75 decibels at 96th Street.
4) A typing office was 75-80 decibels.
5) The noise meter was 80-85 decibels at 101 St. and Madison Ave.
6) At a construction site, the noise level was 85-90 decibels.
7) The uptown train's lowest level was 75 decibels; the highest level was 110 decibels which is dangerous to hearing.
8) A jet taking off was below 130-135 decibels.

Noise is unwanted sound, and most of the places we measured are noisy!

WHAT'S HAPPENING TO OUR CITY'S WATERS

By Sonia De Jesus

Retaining our high drinking water quality, restoring our beach areas and making water once again fun to swim and fish in are goals that are reachable in the next ten years. But water pollution is still a serious problem in New York. There are many ways you can pollute. All you have to do is drink, take a shower, or wash your clothes. Household aids, pesticides, industrial chemicals and wastes from manufacture are also pollutants.

New York City gets its water from upstate, from three systems which are Croton, Catskill and Delaware. The Croton system includes 13 resevoirs and 4 controlled lakes, supplying 14% of the city's needs. The Catskill system includes 2 resevoirs supplying up to 40% of the city's needs. The city has two major tunnels which carry from Hillview Reservoir in the Bronx to all five boroughs.

It is necessary to filter our waters since it is subject to germs from long periods of times in the collecting. Before the water reaches the consumers all of it is chlorinated, and fluoridated several times.

To restore our water New York now operates 13 water pollution plants which treat a total of 1.1 billion gallons of sewage each day. Therefore under the EPA, they are going to construct two new plants. By the 1980's this will provide a minimum of 90% reduction of pollution of raw sewage each day - sewage which is now flowing into the Hudson and East Rivers. A unique water control plant is now being built to treat the untreated sewage into the Hudson River. The following are special projects or plants under construction: North River water pollution control plant, Red Hook water pollution control plant, Jamaica Bay ecological study, Spring Creek water control pollution plant.

The 1972 Federal Water Pollution Control Act bill calls for "zero discharge" into U.S. Waterways by 1985, with an ideal goal of swimmable waters by 1981. In 1971, the Refuse Act became effective. This is a mandatory system for all discharge wastes in U.S. navigable water. The "Rivers and Harbors Appropriation Act of 1889" makes it illegal to discharge from any floating craft, shore or from any manufacturing establishment any refuse matter. This doesn't include sewage discharges.

AIR POLLUTION: YOU CAN HELP

EPA's auxiliary patrol

By Yolanda Rodriguez
Ana Moreno

The SETH Program interviewed Ms. Dina Nolan who is the coordinator of the Auxiliary patrol of the Department of Air Resources. The Auxiliary patrol is a volunteer program to involve the citizens of New York, and assists them when they see smoke, and then they in turn try to send investigators to the premises, where the smoke has been seen. If the investigators witness the smoke themselves, they then issue a violation. The citizens of New York are very cooperative. The Department of Air Resources had received no misinformation. In January of 1975 the program existed only in Brooklyn, Queens and Manhattan, but by April they opened it up to the five boroughs because of the demand. As of January 1977 there are 1,551 volunteer members.

To become a member of the Auxiliary patrol all you have to do is call up and ask for an application. The volunteer does not have the right to issue an summons. The only thing they have to do is check for smoke. The summons are $50 and up. The Auxiliary coordinator Ms. Dina Nolan was very cooperative with the SETH Program. She answered all our questions. If you are interested in join iliary patrol you can call Ms. Nolan at the EPA building. The telephone number is 482-6299.

WARNING: BREATHING MAY BE HAZARDOUS TO YOUR HEALTH

By Wanda Rivera

In recent years scientists have begun to look at man-made pollution to determine where it originates, how we can reduce it and what affects pollution has on human health.

Sources:

The main sources of this air pollution are power generators, incinerators, industrial plant, oilburners and motor vehicles.

Air Pollution Makes You Sick:

Air pollution destroys lung tissue and can lead to emphysema, chronic bronchitis, heart disease and lung cancer. Air Pollution especially affects children, elderly people and those already suffering from heart or lung disease. Polluted air makes your eyes tear and burn, and causes headaches, dizziness and shortness of breath. Fumes of sulfuric acid and nitrogen oxide, sulfuric acid and photochemical oxidants irritate the respiratory system, causing chest discomfort and impaired breathing. Scientists are convinced that air pollution is a very real contributing factor to the 3 major types of diseases that cause sickness and death in our society,heart disease, lung disease, and cancer. Research has shown that air pollution will accelerate the rate of disease in those persons already afflicted, and earlier death is a very real possibility.

Some of the major pollutants are: carbon monoxide, a gas which reduces the oxygen carrying capacity of the lung and can corrode metal, dissolve marble, and damage lung tissue, and hydrocarbons, some of which are cancer producing. Hydrocarbons are not usually dangerous in small concentrations. They take part in the chemical reaction that produces photochemicals or smog. This smog contains aldehyde and other chemical compounds that can irritate the eyes, the upper respiratory tract or the skin. Sulfur dioxide is an invisible gas that forms when fuel containing sulfur is burned. Breathing sulfur dioxide at certain concentrations has a bad effect on the human health. Nitrogen dioxide, irritates the eyes, nose and chest. Longer exposures can cause chronic pulmonary ailment.

Clean Air:

Air is a complex mixture of gases. The composition of air is relatively constant over the surface of the earth. Nitrogen, oxygen, carbon dioxide and water vapor present at all points on the earth surface, but the proportion of each gas varies widely from place to place.

It is sometimes difficult to consider air a material substance. Not only is air invisible, but it also has no definite shape, volum or density. As the attitude increases, the density of the air decreases rapidly. At a height of six miles, you could not obtain enough oxygen to live. Twelve miles up, there is insufficient oxygen to maintain a burning candle. All life that depends on oxygen life is sustained by a very thin slice of 360 miles deep.

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S E T H

ENVIRONMENTAL HEALTH COMMUNITY RESOURCE DIRECTORY AND GUIDE TO EAST HARLEM

The information contained in this booklet includes the different places to contact in case of an emergency, as well as in case of any problems concerning the family, environmental health and legal problems. These places have been contacted and verified by the students of the SETH Program at the Mount Sinai Medical Center as working numbers. They have called each agency to find out about their services, also to know whether there is any kind of fee, or if there is a place closer to the East Harlem Community where people can go and find help.

June, 1977

EMERGENCY NUMBERS

(Manhattan)

Emergency numbers are numbers that you should keep handy (next to the phone, in your wallet, etc.) in the event of an emergency. You should have such numbers as: police department, fire department, doctor, hospital, poison control, and gas leaks.

POLICE: dial 911 in case of emergency
otherwise dial your local police precinct

23rd Precinct - 164 East 102nd St - 860-6411

25th Precinct - 120 East 119th St - 860-6511

Police Information - 374-5000

FIRE: dial 911 OR 628-2900

AMBULANCE: dial 911

If you cannot get through on 911, dial "0" (operator) and tell her what the emergency is.

POISON CONTROL CENTER: 340-4494

DOCTOR'S OFFICE: ______________________ (put your doctor's number here)

GAS LEAKS: 683-8830

SUICIDE PREVENTION: 462-3322

COAST GUARD: 264-8770

FEDERAL BUREAU OF INVESTIGATION: (FBI): 535-7700

U.S. SECRET SERVICE: 466-4400

ENVIRONMENTAL SERVICES

Environmental Services are places that monitor the environment and Environmental action when there is a threat to the environmental quality of an individual or a community.

ENVIRONMENTAL INFORMATION SERVICES

Environmental Information Center
133 East 39th St. - 679-0810

Environmental Protection Administration of New York City
Main Office: 125 Worth St.
General Information: 566-5656
Household evictions: 566-5208
Press: 566-5527
Bulk Collections (Man.East): 289-1800

Parks Information Service: 755-4100

CONSUMER COMPLAINTS & INQUIRIES

Cosmetics: FDA: 965-5065

Foods: NYC Dept. of Health: 566-7726

Hospital Complaints: 566-7726

Housing: Central Complaint Bureau: 960-4800

Medical Devices: FDA: 965-5065

GENERAL

Consumer Affairs Neighborhood Offices-
NYC Dept. of Consumer Affairs:
East Harlem: 348-0600
West Harlem: 222-9700
Federal Information Center: 264-4464
Mayor's Action: 566-5700
Offices of Neighborhood Gov't: 566-1560
State Consumer Protection Bd.: 428-5320

ENVIRONMENTAL ACTION & HEALTH SERVICES

A.S.P.C.A.: 866-7701

Broken Street Lights: ST 6-3700

Car Towed by Police (MIDTOWN) 541-5220

Environmental Coalition
235 East 49th St. - 929-8481

Consumer Affairs Dept: 964-7777

Environmental Defense Fund
527 Madison Ave - 593-2185

Heating Problems/Building Complaints: 960-4800

Pesticides Bur.: 264-2301

Potholes in Street: 964-2110

Sanitation Complaints/Abandoned Car: 964-1800

Sewer Back-up, Street Flooding 966-7500

Traffic, Parking & Transportation: 999-1234

HEALTH SERVICES

These are places that service the community and some of which offer free treatment to members of the community. Other health services are very important to our community, because without health services people who couldn't pay could die. There are many health services around our area. Health services are for any kind of people. There are different departments in the same building. They are for old people, for teenagers, and for middle-aged people, too. Some are specially for infants.

HOSPITALS

The purpose in listing these hospitals is for people who live near them, so they don't have to go so far in an emergency.

Flower & Fifth Avenue
5th Ave. & 106th St.

Joint Disease
1919 Madison Ave.

Memorial Hosp. for Cancer and Allied Diseases
1275 York Avenue

Mount Sinai
98th and 5th Avene

New York Medical Center
560 1st Avenue

Park East
112 East 83rd St.

St. John's
101 Park Avenue

CLINICS

Dr. Fisher - Dentist
106 Lexington Ave.

Oficina Doctor
112th St. and Lexington Ave.

East Harlem Medical Center
115th St. and Lexington Ave.

East Harlem Doctors Group
116th St. and Lexington Ave.

DEPT. OF HEALTH CENTERS

Central Harlem
2238 Fifth Ave. - 690-2600
East Harlem
158 East 115th St - 876-0300
E. River House
412 East 105th St - 534-3949
G.Washington Houses
1777 Third Ave. - 348-1032
Lehman Houses
1589 Madison Ave. - 831-3100
Mt. Morris Park
Madison Ave. & 122nd St. - 534-4612
Wagner Houses
2365 First Ave. - 427-7378

HEALTH SERVICES (continued)

GENERAL INFORMATION

NYC Health Information
125 Worth St. - DAYS: 566-7711
NIGHTS: 566-8237
Abortion
377 Broadway - 233-3100
Animal Bites
125 Worth St. - 566-7105
Bureau of Child Health
125 Worth St. - 566-7086
Central Complaint Control
125 Worth St. - 566-7726
Contagious Diseases
125 Worth St. - 566-6146
Dental at P.S. 99
410 East 100th St. 348-3350
Family Planning Council of NYC
305 Broadway - 962-6150
Food Poisoning
125 Worth St. - 566-7196
Health Education
93 Worth - 566-8112
Immunization Program/Rubella
261 Broadway - 349-2255
Infectious Diseases
125 Worth St. - 566-7131
Maternal & Child Health Serv.
125 Worth St. - 566-8130
Mental Health
51 Chambers St. - 566-4456
Nursing - Public Health
377 Broadway - 566-8119
Nutrition
93 Worth St. - 566-6027
Nutrition TIPS
93 Worth St. - 431-4540
Nutrition TIPS = SPANISH
93 Worth St. - 431-4558

Pest Control
455 First Aven. - 566-8028
Poison Control
455 Fist Ave. - 340-4494
Sanitary Enforcement
125 Worth St. - 566-8210
School Health
125 Worth St. - 566-7070
Tuberculosis
93 Worth St. - 566-8139
Vaccination Information for Travel
125 Worth St. - 566-8220
Venereal Disease Control
93 Worth St. - 566-7685
Venereal Disease Info. SPANISH
93 Worth St. - 691-8733

SOCIAL SERVICES

Social Services are places where you get help when you need it. To help solve family problems, financial problems, job problems, marriage problems, legal problems and many other kinds of problems.

Birth and Death Records - 247-0130

Borough President (Manhattan)
566-4300

Catholic Charities of the
Archdiocese of NY -
Vocational Service
122 East 22nd St. 677-5000

Community Action for Legal Services
335 Broadway - 924-4800

Legal advice and representation for people unable to pay. The types of cases accepted varies from office to office.

Job Corps of New York City
220 Church St. Rm 533 - 433-4700

For young people 16 to 21. Live-in vocational training programs at centers all over the United States. Monthly allowance. SPANISH SPOKEN-SE HABLA ESPANOL.

Marriage License Information
269-2900

Wait 24 hours to be married. License can be used in any part of the City. Mon. to Fri. 9:00 AM to 4:00 PM only $5.00 is the fee.

Mayor's Action Center
566-5700

Handle complaints of all kinds in New York. Social Workers handle all departments for citizens all over New York City. SPANISH SPOKEN. Free Service
566-1160

Medicaid Information - 594-3050

Migration-Commonwealth of P.R.
322 West 45th St. - 245-0700

Job Placement Counseling Services, referrals to other agencies. SPANISH SPOKEN

New York City League of Women Voters
817 Broadway - 674-8484

For Infomation about registration and voting. SPANISH SPOKEN

Police Civillian Complaint Review Board - 477-4550

Recruiting and training program
2364 Eighth Ave. - 666-4710

Preparation for union apprenticeship training program and journeyman placement

DAY CARE CENTERS

East Harlem 876-0300
158 East 115th St.

East River House 534-1800
412 East 105th St.

G. Washington Houses 348-1032
1777 Third Ave.

Wagner Houses 427-7378
2365 First Ave.

EDUCATION INFORMATION

Dropout 673-8254

Information about local counseling services for persons 16 to 22 and veterans who dropped out of school, can be secured by telephoning Auxiliary Services for High School.

New York Board of Education
110 Livingston St.
Brooklyn, NY 11201

Fundamental Adult Education
High School equivalency
English as a second language

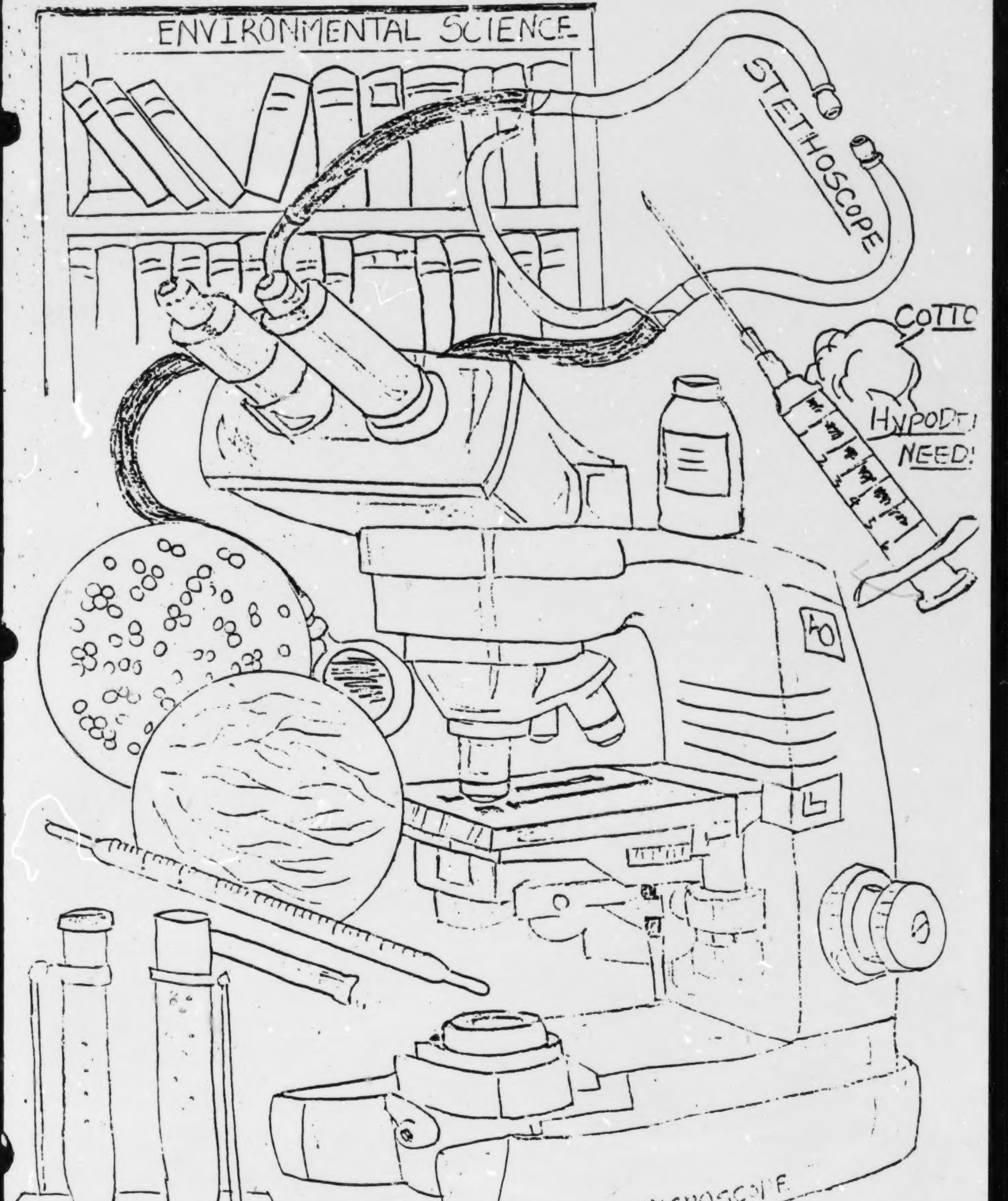
EDUCATION INFORMATION (continued)

New York Civil Liberties Union
Student Rights Project
84 Fifth Ave., NY 10011

Advice and legal aid to students and their parents about school rights. Publishers of The Student Rights Handbook

School (Public) Information
596-5030

This booklet was produced by students of the SETH Program at the Mount Sinai School of Medicine under a Grant from the Office of Environmental Education (Grant #G007602025), 1976-77.


ENVIRONMENTAL SCIENCE
STETHOSCOPE
COTTO
HYPODE
NEED
BINOCULAR MICROSCOPE

The Secondary Education Through Health program offers high school students a unique educational experience. The following essays document the learning experiences of students in their hospital and laboratory placements. The students express their feelings about the placement, their work, and the people who work with them. The grammar and phraseology is that of the student; no corrections were made.

Barbara Lonesome RN
Barbara Lonesome RN
Student Health Instructor
SETH Program

A Excellent

Jose Vazquez
Child-dev.
(essay)

12/17
Mt. Sinai

"Love Hungry Children"

First of all, I was very happy to be invited on the trip. I really loved watching and playing with the kids. I regret missing the film, on the account of being tired. I was curious for a while, just imagine if these kids never get adopted? I really felt like adopting one myself. Just looking at these motherless + fatherless kids can make you shed a few tears. Not ever knowing your parents can be a big blow. The 8th floor was the saddest time, to think the chances of adopting a retarded baby are as good as Nixon running for re-election. (no joke). I can't really see how a parent can abandon their child. Getting into something you can't handle, ain't worth handling. Always be prepared for the unexpected that's my motto. It's like a broken toaster, you'll never know when the bread's gonna pop up.

THE
N
D

P.S. "I Hope u enjoying it."

2 1

3/14/77
Outline

A. Negron
A6 Placement

I. my placement is the Library of Environmental sciences.

II. The Supervisor name is Mary Bell Meyer and she is the Librarian.

III. (A) The Library serves as a departmental Library & information Center for the Environmental Science Laboratory. The Library provides scientific + medical Information. This Library also has journals & other Literature owned by the department. This Library is presently being build up. New Selves are being installed & alot of new books & journals are being brought in. Some Books are being cataloged for the first time.

(B) While I worked here I Learned how to cataloged books, how to write up cards for the books & also I have been to the Library in Annenburg to pick up journals & some book or journals that have been Bound. I also learned the process of Building + organizing a Library.

Con. A. Negron

At first, I thought the people working there were going to talk about me or the person I work with wasn't really going to like me. you know how it is, when a new person come's in to work. Then the people that been working there feel funny with a student around, that sort of thing. But what turned out is that the exact opposite happened. everyBody is so nice & friendly to tell you the truth its a bit funny. But I like the people there and they Like me & thats good. the Lady Im working with is probably one of the nicest Ladies ive meet in this hospital since Ive Been here for 3 years. She is a very understanding & nice person I feel good when I help her because she has alot of work to do. when I first went there and saw all those Books on the table & floor and hardly no selves, I felt Bad. She ~~Looked~~. Looked so sad sitting there. Im glad Im helping her and provided my service to her. She has so many →

(C) I observed how the Library keeps on suppling information to people. How people can just walk in and be helped without any hassle. The journals + Books are together in one section etc.

(D) The significance of work being done in this placement is Tremendous. We always have something because there are so many things to do. Books have to be catalogued + stamped. Pockets have to be pasted to the books. Journals have to be picked up. Cards have to be typed up. Books are to be organized, etc.

(E) My feelings before going to the placement for the first time were pretty scary. I've never worked in a Library before or really know how its organized & runed. But now I feel good about working in the Library. After you stay there for a while you get the sense of need for the books. Handling them + putting them where they belong etc ↓

things to do there without us, She would have alot on her Shoulders. I'm Not Saying without us she's helpless. I Know she managed before we came along (Carmen & I), But at least we help Her a Little Bit. When I leave the Library I feel Bad because we can only be with for 2 to 3 hours the most. and she has alot of Work to do. She needs somebody else to work with her when we leave. But my feeling, deep down, I feel good when I leave. Not Because I Wont Leave, But because I Know that I put in my 2 cents worth. I Know that I help her out in some way. If only I could give more of my Services to her more often.

Megan

Nereida Bonet A' 3.15.77
Miss Lonesome Hospital Placement

Animal Reseach

My Supervisor's name is A. Wallen. The function we do in our floor is to preform surgery on the animals. The doctor put sometime a highly contagious capsule in the animal so we can see the reactions. We have done serveral of the same procedures. ~~Arnold~~ Ronald and ~~Denise~~ [illegible] usually help out in the operation because they have been in Animal Research since they were placed there. Both assist the doctor. They take the stiches in the animal. They must do the stitches right because the animal doesn't laid down all the time like a person does so the stitches will heal properly. The animal puts all the ~~wait~~ weight on his or hers stomach. If the stitches aren't done right they break they will probaby bleed to death. Or the doctor must come back to the hospital to make them again.

We ~~once~~ ~~seen~~ saw an operation done on a dog so the dog can get a stroke which is to block the blood circulation going to the brain. We had seen the heart and lungs. It looks just like our's too.

Mr. A. Watten has talked about if we knew the difference between a vein bleeding and a artery bleeding. He told us the difference if you spot it in an operation so you can clamp it so it will stop bleeding. Sometimes we practice to do surgical stickes. We have a conference with Mr. A. Watten and we stay talking for like two hours. Or we usually as he talks we WRITE.!

Nereida Bonet 3

He will be talking real fast that by the time we finish a sentence he has finish ~~(this)~~ his third sentence. We talked aboutt the different kind of suture and of skin graft. Mr. Watten showed us a book of Skin Graft, it was really inter:est~~ed~~ing. I really liked it but ~~Arnold~~ Ronald and ~~D[illegible]~~ B[illegible] & Ray stop seeing it. But I didn't it was really great.

My feeling in this placement is the Supervisor Mr. A. Watten is a nice man he is concern of us learning and doing it the right way Not to do any short cut to hurry up because the animals are just as important as us human. I can't really have any bad point about him to say. But he is nice and a very respectful man. But I'm sorry to say that I don't like the placement I am in now Animal

Nereida Bonet 4

Reseach. I got to admit to you that I am alway looking and asking for the time. All of us look at the time and are alway ~~(think)~~ thinking when is it time to leave. When it is time to leave I jump for joy!

Sometime we stay without doing anything all day. Everything seems to happen on Tuesday, Thursday, Friday. So you know that Monday and Wednesday ain't so busy. I have to admit to you also that I cut out one time and left to go home. Because I didn't feel like going to the placement.

I'm sorry and I don't like the placement.

Nereida
The
"Joint"

Harold. Auguste. A

I Micro-Biology

II K. Gigi Lab Supervisor (Media).

III-A. The main function of this department is to prepare the food (Media) on which certain bacteria could grow. This is necessary in order to determine what sort of viruse or disease that patients have. That is why this part of the Lab is called the Media lab.

B. The first experience which I went through is to learn how to cope with the small then from there I was able to compose certain medias such as the yeast composition which is mixed with distilled water, and undergoes certain processes. Such as heating and labelling (etc).

Harold Auguste

2

C. My observations were based on actual experiences. In this Media Laboratory, the supervisor really takes interest in the students. Besides teaching us a few skills, he often brings-up a social conversation. I was fascinated to meet Gigi's colleague DR. Robert-A. Ollar, D. Sc visiting Proffessor who spoke french with me. Dr. Ollar is well informed in numerous fields of Science, but his main interest is Micro-Biology.

D. The significance of the work being done in this area, is rather demanding because this whole floor is called the Micro-Biology Laboratory, nevertheless it consists of several branches, take for example my section (Media Lab) prepares certain foods, compositions, which enables bacteria and all sorts of viruses to grow. After preparing these solutions, they are then sent to another branche such as Serology, Chemotherapy, Routine Bacteriology, and Parasitology.

Harold auguste 3

There the foods or solutions are put through a series of complicated experiments to determine what sort of viruse certain patients have. These processes are not only for the sole purpose of finding which is which but also determine (~~this~~) an anti solution to these viruses. This process could take days to find a solution, on the other hand it could take hours it all depends on how fast the Media laboratory takes to release the Medias.

E. One strong feeling I have about this placement is that there aren't enough girls up-here. Nevertheless girls are not the reason that I come to school - [illegible]. These people here cooperate in every-way. It's not like you have a constant rule up here. In this lab we all know to do what we could and if something is not done before we leave, it's allright.

page one

Very good

1

Taylor, Regina
3/12/77

Endoscopy
Myra Chateau - R.N

The function of the particular area in which I work is, dealing with cancer, tumors and etc. The services that the department provides are good.

I have learned that in my placement (Endoscopy) that you are able to locate irregular things. Such as cancer, tumors, and etc?... Try not to use etc.

I have observed again cancer, tumors, and etc.

The significance of the work being done in this area is preventing cancer and tumors from spreading throughout the entire body. And to prevent unnessary operations from being preformed.

To describe my feelings about my placement and the people who work there would be to say. at first I didn't appreciate being placed in Endoscopy. I didn't have any idea of what to expect. Although I was given some background on it. Now that I have star-page 2 Twice

2

Taylor Regina
3/12/77

Endoscopy

ted to get involed it is just about the best thing that I have experienced working in a hospital. You actully get a chance to see inside the human body; (into the stomach; intestines, and ~~the~~ the espiryggest. Sometimes things don't go ~~as~~ as smooth as expected so the pateint is in pain. Athrough sedeated. Sometimes I feel like I'm really helping, like I'm really doing something, and I really don't want to go. But sometimes I get a little sick and can't wait to go. The nurses are really ok, really every one is ok. But some of the doctors could go a little easyer.

Colenoscopy - into the intestines
Gastroscopy - into the stomach
Sigmoidoscopy - through the anus

B- [illegible]

Hospital and ESL Project Paper

④ What are your feelings about performing [illegible]?
⑤ Have you made any / Ms. Lonesome
given from last version to 3/13/77
the version? Bernice James

1. More could have been said about the importance of the work.
② Not too much a discussion of any [illegible] your [illegible].
③ What about the [illegible]
[illegible]

Bernice James

Placement: Animal Research Dept.
Supervisor: Mr. Wallen OR Supervisor

The function of the Animal Research dept is to provide services and equipment to scienctists and doctors who are experimenting of diseases and are involved in research. My learning experiences at Animal Research was interesting. Mr Wallen has taught me how to tie surgical Knots and how to hold ~~Intrus~~ instruments. I have observe open heart surgery, hysterectomys and castrations, gastric surgery and adominal surgery. I have also assited in surgery as a second then a first assistant.

Before going to the placement I feel excited because I really don't Know what to expect. Sometimes the day would be busy. There would be surgery being done in almost every ~~operating~~ operating room. Some days it would be slow with not many

Bernice James

operations. One the slow days, Mr. Wallen will give us notice on certain procedures and operations.

Mr. Wallen is a very nice man who expects a lot out of us. He is also concern about us when we are doing our work. The other people on the floor are helpful to us. The will answer any questions that we may have. The doctors are helpful to us too. They will allow us to assist in surgery and would explain what the procedure is. When I leave Animal Research I will feel sad but experience in the operating room and techenquies.

Nilsa Dominguez
Ms Lonesome

3/10/77
Hospital Experience

Hospital and E.S.L. Project Paper.

The placement I go to is the EKG department. The superviser is Ms. Mary Briggs. This is a large room where all the records for electoardiograms for all the patients are. We are supposed to get the folders and put-in the recent EKG they have taken for the doctors to read them. When I go to the floors, I help Linda, the technitian take the EKG's. Most of the patients are old men and women who suffer from their hearts. I have already learned how to put each suction on each spot (all around the heart) I am learning how to use the machine now. It is relatively easy. You just have to be very observing, because every spot has its own wire Because the machine is automatic, you can clip the papers together and write down the information (date, time, unit #, etc) while it works by itself. Many of the patients are easy to deal with and in less than eight minutes we are ready to go on to the next patient.

There are not enough operators in the hospital to do this job. Therefore the task that Linda has to face is enormous. When the amount of work is so great, no matter how easy it may be, you get exhausted when you are finished. Besides, some patients give you such a hard time that you feel like kicking them and leave their room.

All the people in this area as well as the entire hospital, really work for their salary. There are hundreds of charts you have to file. By noon time the girls are so tired that they they don't bother to look for them anymore, but just make new charts for each patient Thus, everytime you look for a folder, you find two or three for the same pirson. I have noted though, that they keep good record of the EKGs taken. The reason for which I wanted to go to EKG is because I wanted to learn how to read them. I have never had the opportunity to ask any of the doctors because they're always busy. The supervisor is nice. She is not around all the time. The others that work there are fine. I don't talk to them that much. Linda is the one I like best.

Before going to my placement, my only hope is that I could go ~~to~~ up with Linda because I don't like to stay filing. I get dizzy with so many numbers and my nails break. I like going up because I get to know many doctors, nurses, and those old patients that are so nice.

Besides, when I go around the pavillions, I see different things and learn many things because I get a chance to ask about them. Another thing that I like about going around the hospital is that I don't see the same faces everyday. By 11:50, the time that I leave, I'm very hungry and I don't want to stay there any longer.

Hospital & ESL Project paper A Benson Forteau 1
3/14/77

I The placement in which I Work is the Emergency Labatory.

II My Supervisor's name is Mr. Thompson and the title is Labortory Technologist.

III A The the function of the particular area in which I Work basically deals with the Venipunctrening or drawing of the blood from the patient, evalution of the CBC, ESR, CSF, Urine analysis to test for protein, Glucose, PH, Sp. gravity, ketones, accult Blood, microscopies, and Sickleds. The department provides Laboratory evalution Services for emergency Room and clinic. ? What are they

B My learning experience is exciting. I do urine analysis to check for the above, ~~[illegible]~~ I do Sedimentation, I Stain Slides to differentiate the White cells from the red so that the White Cells can be observe under microscope. Recognition of blood platlets and other cells.

C My Observations for the few Weeks are the Component Structure of the Lab, the reagents and the equipments, the different microscopes that are used the patient behavior

Benson Forteau

his or her Condition and reaction, the direction of the staff, nurses, doctors, and nurses aide, and their interests displayed in the lab reports, the effort in keeping the lab and clean in order to avoid the spread of germs

D. The significance of the work being done in this area is to help the medical staff in et evalutaing the patients illness.

E. My feeling about the placement is encouraging and the people who I work with are nice. ~~and~~ They will encourage me to do most of the things that go on in the lab. The feeling I had when I was going to the placement is that, I had hoped that my placement was going to be interesting and exciting. The feeling and attitudes that occur while working is that I like the Operation [illegible] System.

Excellent / A

Barbara Lathan
Hospital Placement

The Hospital placement area where I work, is Therapeutic Activities. My supervisor's ~~ms.~~ name is Mrs. Mary Davis. Mrs Davis is a recreation therapist, in charge of providing ~~the~~ recreation through the Hospital numerous in-patients.

Therapeutic Activities has two major functions: One is to keep the patients that are confined to bed busy by keeping their mind off home and problems which they might have. Second is to provide recreation therapy to those mentally and disturb young and old men and women, boys and girls.

I often believe, through therapeutic activities I have become more patient with other people. I ~~have~~ have learned to listen to people's problems. ~~and~~ I understand what they are saying, Without thinking that they are crazy. I have learn to express my ideas and [illegible] [illegible] life.

On My placement I have learned to [illegible] people and [illegible]

I have seen talked to doctor and nurses that are very devoted to their patients and work. I have seen physical therapist that are very ~~gental~~ gentle and some that don't give a damm. There are patients that complain for unnessary reasons. I have found that many people are devoted to their work and like what they are doing.

However, I believe with out therapeutic activities dept in the Hospital, there would be many bored ~~in the hospital~~ and restless people in the hospital today.

My personal feelings towards the people that I work with are good ones. I have found that in my placement the people are very easy to talk to. They also give encurragement for a person to go ~~on~~ on and be what they really want to be.

Sometimes in the Morning before I go to my placement, I feel like a stranger going into some strange land. At ~~still~~ other times I feel like I don't want to go at all. I often miss my school, friend and the teachers that I know. I sometimes get tired of going to

2

Barbara Latham

my placemint seeing the same old peple And faces everyday.

Errol Graham
Hosp. Placement
3 . 14 . 77

Report

Ms. [illegible]

My placement area is the dental clinic and the supervisor's name is Dr. Martin Ruben. The function of my particular area which is oral surgey is to perform surgey dealing with disease, injuries and defects of the mouth, the jaws and associated structures. This department provides services for the treatment of mouth.

During my time in the dental clinic, I have learned some of names of the instrument used by the doctors, eg. lower universal which is used to extract the lower tooth. I have also learned the procedures for an extraction. eg. The patient is given ~~a~~ novacene by an injection. This is to num the tooth so that while it is been taken out it dosent hurt. After the tooth is num, it is then turned ~~by~~ or losen by a lower or upper universal set, ~~then~~ it is then taken out. I have also seen a

2

biopsy. A piece ~~of gum or~~ tissue of the mouth is taken off for observation. During my experiences there I have seen different case of extraction, some because of the tooth has decayed, infected and cannot be saved. Other are with small children these adult tooth are coming out and their young ~~teeth~~ haven't come out. Therefore the adult teeths are force to grow in a different directions. This is corrected by ~~force~~ taking out the ~~adult~~ young tooth so that the adult ~~teet~~ can grow straight without forcing against anything.

The work is very important in this area because it is here that people come for extraction. If a tooth is infected and not taken out it can affect other parts of the body eg eye ~~or~~ and hearing.

I feels very comfortable at my placement. The people that work there are nice. There are doctors there who love to teach us the students. ~~Dame while.~~ Before going to the placement I was very uncomfortable because

3

Errol Graham

I didn't know what I was going to do there.

In concluding I think I have learned many things about the mouth. In some cases If a person has a problem ~~concerning~~ with the mouth I can help them by giving advice.

1

project paper. B+ Helene Thornton
Ms. Lonesome 3/14/77

I Statement of placement area: -Child Psych

I like my placement because it gives me a chance to work With children Who have different problems. On my floor I work With these children and try to help in anyway I can. The staff are very friendly and help me also.

II Supervisors name + title

The Supervisors name is Mrs. Bukall and her title is ~~head~~ -Titles ~~[illegible]~~ nurse of the child psychology Ward.

III A. The function of this area is to help these Children in the best Way possible so they can get better. The services which are provided are Breakfast, lunch and dinner. -Tell more!

B. My learning experiences are how to handle children such as these. Some of the problem the children are being mix-up because they have been sent to different homes and have different mothers.

C. The observations of this placement that I have seen are; 1. When I first came to the floor there was a boy here who

Used Walk around like he was lost and talk to himself. After a while the staff here Worked With him and now at least he doesn't talk to himself but he still has a somewhat problem.

D. The importance of the work being done here is to help the Children to go home and live normal and happy lives.

E. I like this placement very much. When I get here on Monday and Wednesday morning I push to get to my floor because I like to help and be around children. When it is time for me to leave some of the children ask me to have lunch With them because they don't want me to leave. The staff here are very nice and they help me in any way that they can.

1

Nancy Versailles 1t- 3-14-77

Hospital + Sol Report Area

Dental clinic is my placement area. My superstar' name and title is ~~Ruben, Hatton D.D.S~~ Mr. Lanes. The funtion of the particular area, which is the Oral Surgeon, is for extraction of tooth and the prep room is used for checkup. This department provides a treatment for the mouth.

My learning expriences in this area is to know the name of the instruments that the doctors are using such as:

a) Lower Universal - to extract the lower tooth
b) mirror - to look inside the mouth
2) How to take X-Rays such as bitewings and Panalips

In this area, I've made certain observations such as: Descruption of the Extraction (surgery)

The Head nurse places the surgical instruments in a big plate, and has the patient setting down comfortably in the big chair for the surgery to take place. She places a drape around the neck and the doctor gives the patient an injection in the gum where the tooth will be extracting. After 2 or 3 seconds, the doctor extracts the tooth, and places a in bauze in the place of the missing tooth to stop the bleeding.

The significance of the dental clinic is for

2

for people to have better looking teeth. And I feel happy working at the dental clinic because there's always something for me to do The doctors tell you everything that's going on during or after the surgery. [illegible] ~~Like~~ if a tooth has to be removed, they tell you why they're removing it and how they intend to do it. Besides that, I get along with the volunteers and the nurses that work there. They're all nice.

In the first place, I didn't want to go to the dental clinic because I thought that I was going to be bored as my old placement. But I was wrong, it's a lot different. When I'm working at the dental clinic, I feel that I'm learning something. I even think that I can extract a tooth without being an Oral Surgeon. It looks so easy, in another word, the doctor made it easy for me to know what it's happening. Sometimes I don't want to leave my placement because it's fun working there. It happened once, that I had to leave during the middle of a surgery and I felt sad about it because I wanted to see the end of it. - You could have [illegible] it.

Would you be able to explain [illegible] how a ~~tooth~~ is extracted?

Very good A

1

Catilo Chapman

Hospital Placement Report 3/10/77

I Environmental Science Labortory

II Dr. Susan Daum M.D. in Medicine

III

Ⓐ The function of my placement is to find out how many men working with viny Chloride come down with Cancer of the ~~chest~~ chest and liver. What we do is take there medical files and take out information that may be helpful. We take all the workers from the same factory and Compare them. We compare the men doing maintence work at the Company to the production worker. We do this by the years of onset; total years working at the factory; age and smoking habits. After we compare them by those specification, then we look at their chest xray to see if they are normal or abnormal.

Ⓑ I learn alot of how dangerous occupational disease can be. Also Dr. Daum gives me articel to take home and read on environmental pollutions. I also got to know that research is a slow and sometimes frustrating process.

Ⓒ I'v done little observation. Because I'm in a small office looking through charts and files. Most or all of the time I work by myself.

Ⓓ The significance is that if we can prove that [illegible] -vinyl Chloride is a potent chemical. Then our next goal is to try to pursue the government of closing the factory or the company takes better precautions towards there workers. Which is going to cost them money.

Ⓔ The feeling is not the greatest, but is not bad. The people are just fine. I don't come into to much contact with because they ~~[illegible]~~ ~~they~~ have alot of work to do. It no big thing to me it like a job that has to be done.

#1

Excellent
A

Tracey White

Physical Therapy (Rehabilitation)
Mr. Capecchi - Director of Physical Therapy.

Physical Therapy is an area in which patients are taught to use damage muscles or limbs, through exercise, heat, and massage. Also patients are taught the use of artificial limbs, I learned the uses of these equipment 1- platform lifter (shoe) use for balance, 2- knee cage- prevent knee from going forward, 3- Parafin is a speical medical wax it is held in a metal box. It is use to relax and ease pain, 4- knee exercise, for weak knees, or for a patitent who has had surgery. The knee exerciser strenthens the knees, 5- Extension-(forward), flexion-(Backward), 6- Weights are for strength, 7- Ankle marchine planta flexion with weight, Dorsis-front lift up and down. 8- Eversion with weight inside, inversion with weight outside. 9, Whirl pool bath relaxing and stimulating, 9-(Arm pool, Waste pool, leg pool, body pool, use for relaxing and stimulating, 11- Walker- use for →

#2

Tracey White

balance and helping the patient to walk, 12- Hot pads and cold pads are placed on the shoulders, arms, knees, and back they are used to ease pain. 13-restirator- a bicycle with peddles use for strengthening the legs and the knees, 14- Rolascates use for moving the legs across a flat board, 15- Orthopedics ward replace hips, shoulders and knees, and also partial placements. When amputating a limb doctors use an electric saw. When a hip or shoulder or knee is placed in position it usually lasts about 5-10 yrs depending on the age or activity of the patient. One time I observed a nurse cleaning a patients foot with a water pik. The bottom of patients foot was partially amputated. So the nurses let him bathe his foot in a whirl pool bath. And use the water pik to reach parts that the water could not. People are taught to use or control parts of their body that they never used or was damaged or was operated on. They are taught to grip, walk, lift, & do all saughts of things to help themselves out.

#3

Tracy White

I like the placement and the people who work their. They help me out and I help them out by assisting them with certain patients. They are friendly and I learn alot. Before going to the placement I felt a little nervous. I did not know what I was going to do. I did not know what activities I was going to be involved in or the people I was going to be involved in. While I work I am comfortable and at ease. Sometimes I get a little nervous if I am not sure. So I ask someone. When it is time to leave I am pleased because around lunchtime it gets a little boring, because it's lunch time and most of the patients are gone so it gets boring. But I like the placement It's very interesting and I learn alot.

I

A'

Zaida Matos
9-13-77

Project Paper
Miss Lenocome

I work in Data Processing. This is across the street from the school at E. 102 St. on the 4th floor. My supervisor's name is Mrs. Marks. I work there from 9:00 to 11:50 on Mondays and Wednesdays.

The service that this department provide is for the entire hospital. They have all the information the hospital needs and everyday there are papers which are processed by the computers which the people from the hospital come to pick up.

In Data Processing I have learned to use the adding machine and Ms Marks was showing me how to use the key punch machine. Most of the time I'am working

next page →

II

Zaida Mateo

with the adding machine. Sometimes I go into the computer room and watch them work on the computers and see how the information comes out of the computer. In Data Processing all the work that goes out must be accurate because this is what the hospital goes by and if they make a mistake its going to affect the hospital.

I like working there because the people are real nice and they don't rush you to do anything. If I need any help because I don't understand something they are happy to explain it to me. Before I go to my placement I feel tired and don't want to go but after I'am there I feel like working. While

next page →

III

3

Zaida Matos

I'am working I don't really feel anything because I'am to busy to think about anything. When I leave my placement I feel very hungry and I'am really to eat something.

2 copies each page /

A+

Stephanie Roberson
3/4/77

Vocational Rehabilitation

Every Monday and Wednesday morning from 9:00 to 11:50 I go to the Vocational Rehabilitation area of the Mount Sinai Hospital. There I report to MR. Ed. Provder, Supervisor of vocational facilities.

The function of Vocational Rehabilitation is to evaluate emotionally and/or physically disturbed patients for work or job training. MR Provder prefers that they be called clients. The clients, (who are referred to V.R. by social workers, doctors, O.V.R. counselors, or other professionals) are evaluated on terms of ability, punctuality, quality & quantity of work, and emotional & physical tolerance. The V.R. area of the hospital is divided into two sections: workshop & evaluation area's. Evaluation of the clients is done in the Evaluation Area.

V.R. provides many services for the hospital. These services are conducted in the Workshop Area of the V.R areas. Some of the services provided are sewing (Lab coats, curtains, patients gowns etc.); inserting & labeling mailing material.

(plus other clerical duties), assembling & wrapping of surgical instruments, and making badges, & rubber stamps, & name plates for hospital personnel, and offices.

As a V.R. Aide to MR Provider I have learned to evaluate individuals for clerical, & sewing machine operator positions. Right now I am in the process of learning how to distribute and evaluate clients on a one-to-one basis. I have learned to look for the following characteristics when evaluating a client: neatness, level of concentration, coordination, and the clients ability to follow instructions.

The significance of the work being done in V.R. is to give the emotionally and physically disabled a chance to find themselves a place in society. The experiences the disabled get from can sometimes increase the clients self esteem with emphasis on preparing them for training or employment. This is done in the workshop area. The workshop area is set up as if in a factory. This gives the client (who usually has never work has had little work experience) a chance to get the feeling of a working atmosphere.

Stephanie Roberson

Even though the jobs that I do are very routine (but so is everything else) I really enjoy working in V.R. I like contributing my services in helping someone who is less fortunate than me. The V.R staff seems very interested in helping me get as much educational in this area as possible. The clients don't seem to resent or object to my being in V.R. either.

Department of Air Resources
Ethan C. Eldon, Commissioner

Edward F. Ferrand, Asst. Commissioner

Bureau of Technical Services
51 Astor Place
New York City 10003 566-2717

Environmental Protection Administration

Air Resources

The City of New York

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Very good
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Zelma Colon

My supervisor's name is Charles Smith. In my placement the service is to find out how much pollution was in the air in 24 hours. To find out how much pollution is in different places. To find out about this some men go out into the field. They go to different stations to find out how much pollution is in the air. There are ten stations. We have learned how to do Hi-Vols. (These are fiber glass in an envelope that tells us how much pollution was in the air in 24 hours.) I also do smoke shades they are some books that have numbers and I have to recordect them in the smoke shades sheets. I also answer the phone when it rings. There are about 6 different phones that I have to answer. The significance is to find out if the air pollution is getting worse or better in different areas. So far I like the people which I am working with. They are about ten men and two women. They are all nice and when I don't understand something they are willing to tell me about it. I like the placement a lot, because I feel like if I was a office lady. I feel like I am ~~pl~~ part of the team. Before I come to the placement I am happy to know that I am going. When it is time to leave I wish that I could stay longer because I feel 2 like I am an important person here. I like it here alot and on Wednesdays that I have to leave early because I got to go to Geometry fourth period I get sad because I would like to stay longer.

So as you can see I like it here very much, and when it is time to go I wish I could stay longer. I might not know alot of things that are happening here, but the most important thing is that I like it. I am really glad to be here. I wish I could work here longer and more days.

From Zelma Colon